

# **FFI RAPPORT**

## **REKONFIGURERBAR PROSESSERINGSMODUL - FPGAkort versjon2**

SØRNES Per K

**FFI/RAPPORT-2002/02364**



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Godkjent  
Kjeller 25 juli 2002

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Forskningsjef

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**FORSVARETS FORSKNINGSINSTITUTT**  
**Norwegian Defence Research Establishment**  
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## REKONFIGURERBAR PROSESSERINGSMODUL - FPGAkort versjon2

### 1 INNLEDNING

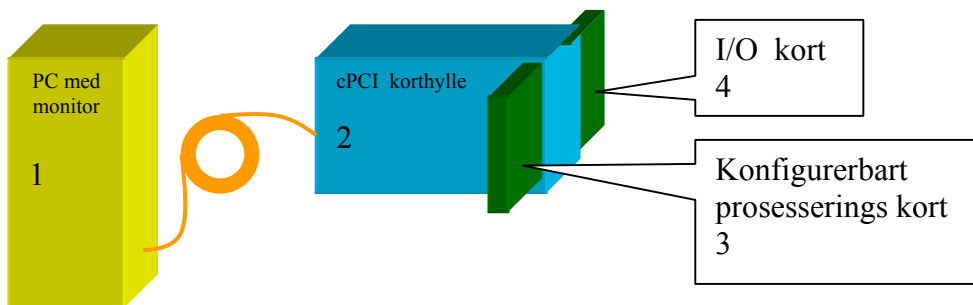
I prosjekt 726 Digital multistatisk radar er det utviklet en radarsender og -mottaker(1) for å verifisere et multistatisk radarkonsept (2). Det er utviklet en demonstrator bestående av en sender og en mottaker slik at det pr dags dato er et bistatisk radarsystem(3). I et bistatisk radaroppsett er sender og mottaker geografisk separert. Det bistatiske radarsystemet synkroniseres i tid og frekvens ved hjelp av GPS disiplinerte rubidium oscillatorer. Det er således ingen fysisk forbindelse mellom sender og mottaker. Senderenheten som er utviklet i prosjektet sender et kodet kontinuerlig signal (Continuous Wave - CW) og mottakeren mottar eventuelt reflektert signal. All nødvendig signalprosessering er tenkt utført på mottakerenheten i sann tid. Dette består av en korthylle med to forskjellige kort. Ett kort er et IOkort, det andre er prosesseringskort, laget i to versjoner. På det tidspunkt denne rapporten skrives er elektronikken for signalprosessering ikke fullført. Slik at mottakeren i demonstratoren fungerer som en datainnsamlingsenhet. All signalprosessering foregår pr dags dato på PC i etterkant av målingene.

### 2 HARDWARE SYSTEMBESKRIVELSE

Systemet består av 4 hovedmoduler.

1. En PC med mulig nettilknytning
2. En Compact PCI (cPCI) korthylle inneholdende bakplan og kommunikasjon til PC.
3. Kort som utgjør selve regnekraften.
4. I/O kort. Et tilkoblingskort for digital og analog I/O.

I denne dokumentasjonen vil FPGAkort2 prosesserings kortet(3) bli beskrevet.



Figur 2.1 System oversikt

## 2.1 Systembetragtning

Prosesseringskortene og IOkortet designer vi selv, resten av systemet er innkjøpt. Forbindelsen mellom PC og korthylle er transparent slik at prosessorkortene opptrer logisk på PCens PCI buss. cPCI korthylla kan inneholde maksimalt 12 kort, dvs. minst ett kontroller kort og 11 prosesseringskort eller færre. I systemet trenger vi også ett IOkort.

PCen kan være en enkeltkort PC, eller som vi har valgt, et forlenger system til en vanlig PC. Hvis vi i systemet trenger noe annet en våre egne spesialkort er dette fullt mulig, fordi vi har valgt en standard cPCI hylle med standard kontakter.

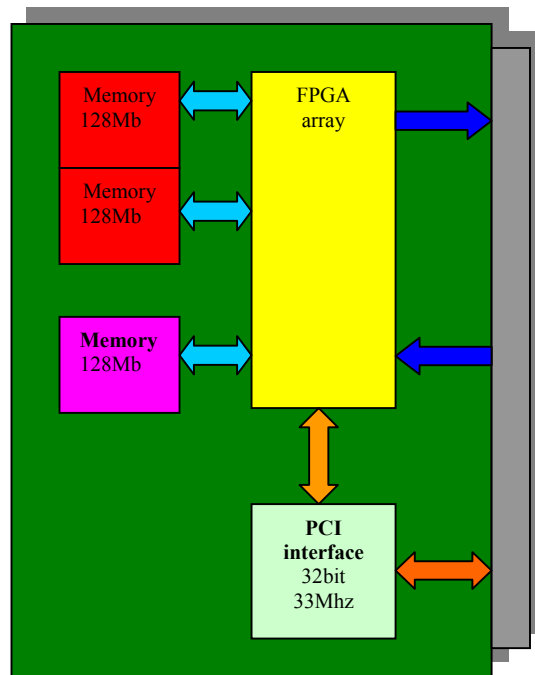
Prosesseringskortene er beregnet på å stå i en kjede, og regner da på en strøm av data. Dette er velegnet for blant annet FFTer og andre oppgaver som kan deles på denne måten. Hvert kort har tre minner, to blir brukt som minne for inndata og utdata, det tredje minne er tenkt brukt til filter minne ved eventuell FFT prosessering. Selve regnemodulen er brukerprogrammerbar og består av tre "Field Programmable Gate Array"(FPGA) kretser. Se figur 1.2.

## 2.2 Prosesseringskort oversikt

Dette kortet er oppdelt i flere moduler. Som systemkontroll og lavrate inngang og utgang sitter det et PCIinterface. Gjennom denne foregår all kontroll og konfigurasjon av systemet. For å få systemet definert ved påslag sitter det en enkel "Programmable Logic Device"(PLD) for dette formålet. Den dekodeer noen få signaler slik at systemet lar seg konfigurere fra software. Selve programmeringen av FPGA matrisen foregår også her, via "Joint Test Action Group"(JTAG) kjeden som finnes som en undermodul i PCIinterfacet.

JTAGmodulen består av en egen JTAGkontroller som tar seg av all datatransport for både programmering og test. Etersom PCIbussen allokeres dynamisk er det også implementert et id-register som forteller hvor i systemet kortet sitter med den spesifikke allokerede adressen. Dette er nødvendig på grunn av at vi må vite hvor i systemet hvert enkelt kort befinner seg. Id-koden er en kopi av posisjons signalene som er implementert i bakplanet.

Hvert kort er tilkoplest neste kort i kjeden via bakplanet. Dette er også en grunn til at vi må vite hvilket kort som sitter i de respektive posisjonene. PCI dekodeerkretsen er også brukerkonfigurerbar. Dette brukes til å definere brukerområder og til minne allokering.



Figur 2.2 Prosesserings kort

### 2.3 Beskrivelse av FPGA sammenkoblingen

FPGA modulen består av tre FPGAkretser som er koplet sammen med hverandre. To av kretsene har også forbindelse med bakplanet. Modul 0 som er koplet til inngangen har ett minne tilkople. Modul 1 er koplet til sine naboer og har også mulighet for å lese ut temperatur på kortet og chiptemperaturen i alle FPGAkretsene. Modul 2 som er tilkople til utgangen har to minner tilkoble og må ta seg av minnehåndtering.

Pinne allokering i FPGA kretsene er beskrevet i Appendiks A. Appendiks A er oppdelt slik:

Appendiks A.1.1 Xilinx0 Input pinner

Appendiks A.1.2 Xilinx0 'Inter Connect' pinner til Xilinx1

Appendiks A.1.3 Xilinx0 Filter Minne

Appendiks A.1.4 Xilinx0 localbus

Appendiks A.1.5 Xilinx0 klokkepinner

Appendiks A.1.6 Xilinx0 testpinner

Appendiks A.1.5 Xilinx0 prom, jtag, mode og temperaturdioder

Appendiks A.2.1 Xilinx1 'Inter Connect' pinner til Xilinx0

Appendiks A.2.2 Xilinx1 'Inter Connect' pinner til Xilinx2

Appendiks A.2.3 Xilinx1 localbus

Appendiks A.2.4 Xilinx1 bakplan bus

Appendiks A.2.5 Xilinx1 klokkepinner

Appendiks A.2.6 Xilinx1 testpinner

Appendiks A.2.7 Xilinx1 prom, jtag, mode og temperaturdioder

Appendiks A.3.1 Xilinx2 'Inter Connect' pinner til Xilinx1

Appendiks A.3.2 Xilinx2 'output' pinner

Appendiks A.3.3 Xilinx2 minne 1

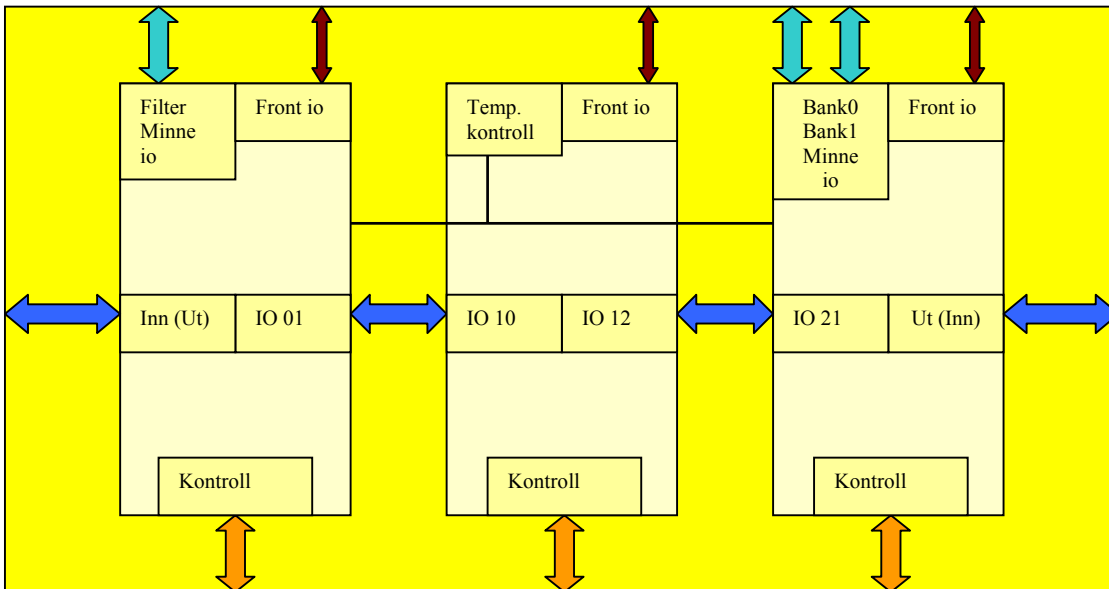
Appendiks A.3.4 Xilinx2 minne 2

Appendiks A.3.5 Xilinx2 localbus

Appendiks A.3.6 Xilinx2 klokkepinner

Appendiks A.3.7 Xilinx2 testpinner

Appendiks A.3.8 Xilinx2 prom, jtag, mode og temperaturdioder



Figur 2.3 Oppdeling av de programmerbare FPGA resursene

## 2.4 Beskrivelse av delene i FPGA arrayet

Logikk som er implementert rundt alle FPGAene:

- Hver FPGA har tre PROMer som kan lastes opp ifra JTAG bussen. I denne forbindelse er det lagt inn tre jumbere som heter "deadlock\_xX". Disse "deadlock" jumbere er satt inn for å få systemet enkelt ut av en fastlåst situasjon hvis programmeringen henger seg, er ufullstendig eller det blir lagt inn feil program.
- Hver FPGA har en ekstern sensor krets for utlesing av temperatur. Det kan leses ut temperatur i chipen på FPGAene og temperaturen i sensorkretsen. Dette blir lest ut serielt og utlesningslogikken er lagt inn i Xilinx1.
- Hver FPGA har en testkontakt som passer til HP analysatorer. Denne kontakten kan også programmeres til å være en digital inn- eller utgang på front av kortet. Det er også satt inn en jumbere, hvis det er ønskelig å trekke litt strøm fra kontakten til små applikasjoner. Se Appendiks A for oversikt over testkontakter og tilkobling til FPGA kretsen. Parallelt med testkontakten er det satt av plass til lysdioder. Denne monteringen er gjort slik at de har ett felles ben i midten og driving på hver side. Det er da mulig å montere 2 dioder i høyden for å spare plass. **Vær klar over monteringsretningen!** Testkontaktene har fått feil navn på utlegget, tpc1\_x0 = U7, tpc1\_x1 = U6, tpc1\_x2 = U5, tpc3\_x0 = U2 og tpc3\_x1 = tpc3\_x0.
- Det er satt inn en ekstra test kontakt på alle FPGA kretsene, slik at alle pinner på FPGA

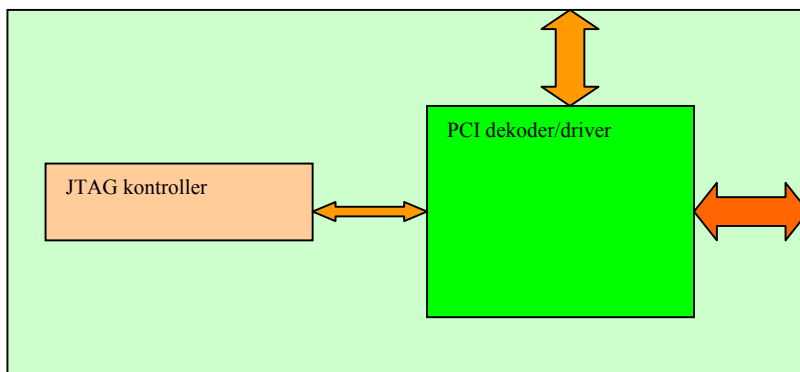
kretsen er brukt eller tilgjengelig for test eller ”strapping”. Signalnivået på disse testpinnene er TTL med maks spenning på 3.3V. Disse er ikke buffret og går direkte til FPGA kretsen som **ikke tåler mer en 3.3V inn!**

Logikk som er implementert rundt FPGA 0 og 2.

- FPGA 0 og 2 er tilkoblet minne. For å kunne generere riktig klokke til disse, er det satt inn ett eksternt klokke buffer med tilbakekobling tilbake til FPGA kretsen.

## 2.5 Beskrivelse av PCI interfacet og JTAG modulen

PCI interfacet består av en PCI 9030 fra PLX som er kjøpt til formålet. Den er koblet til lokal bussen. I tillegg til dette er den også koblet til en JTAG kontroller som tar seg av programmeringen av FPGA kretser og statisk oppkoblingstest av kortet. For å definere kontrolleren ved oppstart er det satt inn en 22V10 PLD. Det ble valgt 32bits PCI interface, istedenfor 64bits interface, på grunn av at hoveddatastrømmen ikke går via PCI bussen, kun ferdig prosesserte data og kontroll informasjon. PCI 9030 kretsen har også en PROM tilkoblet slik at det ikke er nødvendig å laste opp kretsen etter påslag hvis det ikke er noen forandringer i oppsettet.



Figur 2.4 PCI dekodeer

## 2.6 Beskrivelse av Klokkegenerator

Klokkegenerator er laget fleksibel for å kunne velge klokkehastigheter etter ønske. Vi har implementert punkt til punkt forbindelse på klokkene.

Modulen har 3 faselåste klokkekretser.

- Clk1 kretsen er satt i 1:1 modus og brukes bare som faselåst buffer. Den har en jumper (jmp1\_clk) i front for å velge mellom eksternt SMA konnektor eller internt 50Mhz krystall.
- Clk2 kretsen er satt i 1:1 modus og brukes bare som faselåst buffer. Den er koblet til felles klokka (com\_clk) som kommer fra bakplanet.
- Clk3 er en ren faselåst klokkebuffer og mater alle moduler i systemet med felles I/O klokke. Det sitter en jumper i front (jmp2\_clk) som brukes til å velge mellom PCI klokka, felles bakplan klokka eller 50Mhz krystallet/ekstern inngang klokka (ref Clk1 tidligere i kapitlet).

Referansen på den eksterne inngangen har blitt feil på utlegget. 'clk\_conn' = U1. Nivået inn på

den eksterne klokka er TTL nivå og inngangen er terminert med impedans på 50ohm, 100ohm til 5V og 100ohm til jord. Plasseringen på kortet er i øvre bakkant av JTAG kontakten, se Appendiks D.5 for plassering. Se Appendiks B for plassering av jumpere og settingen.

## 2.7 Beskrivelse av support elektronikken

Support designet samler opp resten av nødvendig logikk.

- ID register.  
Dette er et buffer som leses direkte ifra posisjons ID som er implementert i bakplanet. Det forteller bruker hvor i bakplanet kortet er plassert.
- Dekoder PLD.  
Dette er en forhånds programmert krets. Denne måtte vi putte inn for å definere systemet ved oppstart. Den dekode ID-register, setter programmerings modus for Xinlinx og lager dekodings signal for JTAG kretsen. Ligninger er vedlagt i Appendiks C.
- JTAG interface.  
JTAG dekoderen er en 74LVT8980 kontroller fra Texas Instruments. Denne kretsen tar seg av all fysisk tilkobling mot JTAG bussen. Det er satt inn en jumper slik at den kan deaktiveres og JTAG bussen kan da tilkobles direkte til en ekstern JTAG kontroller gjennom kontakten 'jtagcon'. Denne ble satt inn pga at produsenten varslet at det kunne bli forandring på aktiv tilstand på aktiverings signalet (\_toe). På utlegget har ekstern JTAG kontakt fått navet 'U3', på skjema heter den 'jtagcon'. Se Appendiks B for plassering av jumpere og settingen.
- Front bus.  
Front bussen er en liten del av local bussen og er tenkt brukt til flere ting. Den inneholder essensielle kontroll signaler, 5bit adresse og 4bit data. Denne bussen ble implementert for å forekle testing av registre og for testing av timing på local bussen. Den kan også brukes som ekstra inn/ut buss i spesielle tilfeller. Se følgende eksempler:
  - Tilkobling av signalene inn i en analysator og se på lokalbussen der. Kontakten er designet slik at det passer direkte til HP analysatorer. **Husk å koble ifra strømtilførsels jumperen!** (t3\_local\_vcc)
  - Det kan kobles til styring eller display via kabel eller direkte med et lite kort. Det er lagt inn en jumper slik at det kan trekkes litt strøm ifra kontakten til mindre applikasjoner. (t3\_local\_vcc)

Signalnivået inn og ut er standard TTL nivå. Signalene er buffret gjennom en ACT16244 krets. Se Appendiks D.1 for definisjon av kontakten. I skjema heter kontakten (t1\_local), utleggs programmet har brukt (U4.)

## 3 IMPLEMENTASJON

I vårt design har vi valgt å bruke Virtex-E (FPGA) kretser fra Xilinx. Som nevnt valgte vi standard compactPCI kortstandard for våre kort.

Skjemaene er delt opp i 5 undernivåer, hvert undernivå kan bestå av ett eller flere ark.

Skema navn	Antall ark	Innhold
fpgaboard2 (top) Appendiks E.1	5	Ark1: Alle undernivåer og deres sammenkopling Ark2: Kant kontaktene Ark3: Testpunkter og PCI terminering Ark4: Avkoblings kondensatorer Ark5: Avkoblings kondensatorer
pciplx Appendiks E.2	2	Ark1: 'Mapping' av signalene i 'localbus' og PCI kontroller Ark2: PCI kontroller med 'flashprom'
clkgen Appendiks E.3	1	Oscillator og klokke drivere.
support Appendiks E.4	1	JTAG kontroller og ruter, id-register, LED driver og PLD
arrayfpga Appendiks E.5	3	Ark1: FPGA0, 'flashprom', temperatursensor og test punkter. Ark2: FPGA1, 'flashprom', temperatursensor og test punkter. Ark3: FPGA2, 'flashprom', temperatursensor og test punkter.
memory Appendiks E.6	1	Kontakt for 'SO-DIMM' minnene.

*Tabell 2.1 Oversikt over skjemaer*

Alle skjemaer er lagt inn som Appendiks E.

Fysisk utlegg er lagt inn i Appendiks F.

#### **4 KONKLUSJON**

Dette kortet er designet og det er laget printkort. Disse kortene har dårlige og ustabile gjennomplettinger. Det er derfor bestemt at det skal ventes med endelig uttesting av dette kortet.

## A PINNEALLOKERING

### A.1 Xilinx0

#### A.1.1 Input pinner

PIN "PAD810" "AC39" input (0)	PIN "PAD765" "AK38" input (26)	PIN "PAD712" "AV36" input (52)
PIN "PAD809" "AC38" input (1)	PIN "PAD760" "AK37" input (27)	PIN "PAD714" "AU36" input (53)
PIN "PAD804" "AD39" input (2)	PIN "PAD758" "AK36" input (28)	PIN "PAD699" "AW35" input (54)
PIN "PAD802" "AD38" input (3)	PIN "PAD759" "AL39" input (29)	PIN "PAD704" "AV35" input (55)
PIN "PAD811" "AD37" input (4)	PIN "PAD757" "AL38" input (30)	PIN "PAD692" "AW34" input (56)
PIN "PAD805" "AD36" input (5)	PIN "PAD752" "AL37" input (31)	PIN "PAD697" "AV34" input (57)
PIN "PAD797" "AE39" input (6)	PIN "PAD750" "AL36" input (32)	PIN "PAD713" "AU34" input (58)
PIN "PAD790" "AE38" input (7)	PIN "PAD751" "AM39" input (33)	PIN "PAD716" "AT34" input (59)
PIN "PAD803" "AE37" input (8)	PIN "PAD745" "AM38" input (34)	PIN "PAD683" "AW33" input (60)
PIN "PAD798" "AE36" input (9)	PIN "PAD749" "AM37" input (35)	PIN "PAD689" "AV33" input (61)
PIN "PAD788" "AF39" input (10)	PIN "PAD744" "AM36" input (36)	PIN "PAD705" "AU33" input (62)
PIN "PAD796" "AF38" input (11)	PIN "PAD743" "AN39" input (37)	PIN "PAD711" "AT33" input (63)
PIN "PAD795" "AF37" input (12)	PIN "PAD738" "AN38" input (38)	PIN "PAD681" "AW32" input (64)
PIN "PAD789" "AF36" input (13)	PIN "PAD742" "AN37" input (39)	PIN "PAD696" "AV32" input (65)
PIN "PAD782" "AG39" input (14)	PIN "PAD737" "AN36" input (40)	PIN "PAD698" "AU32" input (66)
PIN "PAD780" "AG38" input (15)	PIN "PAD736" "AP39" input (41)	PIN "PAD703" "AT32" input (67)
PIN "PAD787" "AG37" input (16)	PIN "PAD735" "AP38" input (42)	PIN "PAD673" "AW31" input (68)
PIN "PAD781" "AG36" input (17)	PIN "PAD730" "AP37" input (43)	PIN "PAD675" "AV31" input (69)
PIN "PAD779" "AH39" input (18)	PIN "PAD728" "AP36" input (44)	PIN "PAD690" "AU31" input (70)
PIN "PAD775" "AH38" input (19)	PIN "PAD733" "AR39" input (45)	PIN "PAD691" "AT31" input (71)
PIN "PAD773" "AH37" input (20)	PIN "PAD727" "AR38" input (46)	PIN "PAD666" "AW30" input (72)
PIN "PAD774" "AJ39" input (21)	PIN "PAD725" "AR37" input (47)	PIN "PAD668" "AV30" input (73)
PIN "PAD772" "AJ38" input (22)	PIN "PAD721" "AR36" input (48)	PIN "PAD682" "AU30" input (74)
PIN "PAD768" "AJ37" input (23)	PIN "PAD729" "AT39" input (49)	PIN "PAD825" "AC37" input (75)
PIN "PAD766" "AJ36" input (24)	PIN "PAD722" "AT38" input (50)	
PIN "PAD767" "AK39" input (25)	PIN "PAD706" "AW36" input (51)	

#### A.1.2 Xilinx0 'Inter Connect' pinner til Xilinx1

PIN "PAD324" "P1 ic1 (0)	PIN "PAD247" "D3 ic1 (36)	PIN "PAD163" "A14 ic1 (72)
PIN "PAD317" "N1 ic1 (1)	PIN "PAD234" "A4 ic1 (37)	PIN "PAD164" "B14 ic1 (73)
PIN "PAD316" "N2 ic1 (2)	PIN "PAD226" "A5 ic1 (38)	PIN "PAD173" "C14 ic1 (74)
PIN "PAD295" "N3 ic1 (3)	PIN "PAD232" "B5 ic1 (39)	PIN "PAD179" "D14 ic1 (75)
PIN "PAD293" "N4 ic1 (4)	PIN "PAD236" "C5 ic1 (40)	PIN "PAD156" "A15 ic1 (76)
PIN "PAD310" "M1 ic1 (5)	PIN "PAD219" "A6 ic1 (41)	PIN "PAD158" "B15 ic1 (77)
PIN "PAD308" "M2 ic1 (6)	PIN "PAD224" "B6 ic1 (42)	PIN "PAD165" "C15 ic1 (78)
PIN "PAD288" "M3 ic1 (7)	PIN "PAD231" "C6 ic1 (43)	PIN "PAD171" "D15 ic1 (79)
PIN "PAD302" "L1 ic1 (8)	PIN "PAD233" "D6 ic1 (44)	PIN "PAD144" "A16 ic1 (80)
PIN "PAD299" "L2 ic1 (9)	PIN "PAD212" "A7 ic1 (45)	PIN "PAD151" "B16 ic1 (81)
PIN "PAD286" "L3 ic1 (10)	PIN "PAD217" "B7 ic1 (46)	PIN "PAD157" "C16 ic1 (82)
PIN "PAD280" "L4 ic1 (11)	PIN "PAD223" "C7 ic1 (47)	PIN "PAD159" "D16 ic1 (83)
PIN "PAD294" "K1 ic1 (12)	PIN "PAD225" "D7 ic1 (48)	PIN "PAD136" "A17 ic1 (84)
PIN "PAD292" "K2 ic1 (13)	PIN "PAD209" "A8 ic1 (49)	PIN "PAD142" "B17 ic1 (85)
PIN "PAD278" "K3 ic1 (14)	PIN "PAD210" "B8 ic1 (50)	PIN "PAD149" "C17 ic1 (86)
PIN "PAD272" "K4 ic1 (15)	PIN "PAD216" "C8 ic1 (51)	PIN "PAD150" "D17 ic1 (87)
PIN "PAD287" "J1 ic1 (16)	PIN "PAD218" "D8 ic1 (52)	PIN "PAD152" "E17 ic1 (88)
PIN "PAD285" "J2 ic1 (17)	PIN "PAD201" "A9 ic1 (53)	PIN "PAD129" "A18 ic1 (89)
PIN "PAD269" "J3 ic1 (18)	PIN "PAD203" "B9 ic1 (54)	PIN "PAD134" "B18 ic1 (90)
PIN "PAD264" "J4 ic1 (19)	PIN "PAD204" "C9 ic1 (55)	PIN "PAD135" "C18 ic1 (91)
PIN "PAD279" "H1 ic1 (20)	PIN "PAD211" "D9 ic1 (56)	PIN "PAD141" "D18 ic1 (92)
PIN "PAD277" "H2 ic1 (21)	PIN "PAD193" "A10 ic1 (57)	PIN "PAD143" "E18 ic1 (93)
PIN "PAD262" "H3 ic1 (22)	PIN "PAD195" "B10 ic1 (58)	PIN "PAD121" "A19 ic1 (94)
PIN "PAD257" "H4 ic1 (23)	PIN "PAD196" "C10 ic1 (59)	PIN "PAD127" "B19 ic1 (95)
PIN "PAD271" "G1 ic1 (24)	PIN "PAD202" "D10 ic1 (60)	PIN "PAD128" "C19 ic1 (96)
PIN "PAD270" "G2 ic1 (25)	PIN "PAD186" "A11 ic1 (61)	PIN "PAD133" "D19 ic1 (97)
PIN "PAD255" "G3 ic1 (26)	PIN "PAD188" "B11 ic1 (62)	PIN "PAD113" "B20 ic1 (98)
PIN "PAD250" "G4 ic1 (27)	PIN "PAD189" "C11 ic1 (63)	PIN "PAD108" "A21 ic1 (99)
PIN "PAD265" "F1 ic1 (28)	PIN "PAD194" "D11 ic1 (64)	PIN "PAD106" "B21 ic1 (100)
PIN "PAD263" "F2 ic1 (29)	PIN "PAD174" "A12 ic1 (65)	PIN "PAD126" "C21 ic1 (101)
PIN "PAD248" "F3 ic1 (30)	PIN "PAD181" "B12 ic1 (66)	PIN "PAD100" "A22 ic1 (102)
PIN "PAD245" "F4 ic1 (31)	PIN "PAD187" "C12 ic1 (67)	PIN "PAD98" "B22 ic1 (103)
PIN "PAD258" "E1 ic1 (32)	PIN "PAD166" "A13 ic1 (68)	PIN "PAD120" "C22 ic1 (104)
PIN "PAD256" "E2 ic1 (33)	PIN "PAD172" "B13 ic1 (69)	PIN "PAD114" "D22 ic1 (105)
PIN "PAD253" "D1 ic1 (34)	PIN "PAD180" "C13 ic1 (70)	PIN "PAD112" "E22 ic1 (106)
PIN "PAD249" "D2 ic1 (35)	PIN "PAD182" "D13 ic1 (71)	PIN "PAD92" "A23 ic1 (107)



PIN "PAD90" "B23" icl(108)	PIN "PAD17" "D33" icl(150)	PIN "PAD914" "L36" icl(192)
PIN "PAD107" "C23" icl(109)	PIN "PAD23" "A34" icl(151)	PIN "PAD886" "M39" icl(193)
PIN "PAD105" "D23" icl(110)	PIN "PAD18" "B34" icl(152)	PIN "PAD892" "M38" icl(194)
PIN "PAD99" "E23" icl(111)	PIN "PAD15" "C34" icl(153)	PIN "PAD907" "M37" icl(195)
PIN "PAD89" "A24" icl(112)	PIN "PAD9" "D34" icl(154)	PIN "PAD883" "N39" icl(196)
PIN "PAD97" "B24" icl(113)	PIN "PAD16" "A35" icl(155)	PIN "PAD884" "N38" icl(197)
PIN "PAD91" "C24" icl(114)	PIN "PAD10" "B35" icl(156)	PIN "PAD900" "N37" icl(198)
PIN "PAD85" "D24" icl(115)	PIN "PAD7" "C35" icl(157)	PIN "PAD902" "N36" icl(199)
PIN "PAD84" "A25" icl(116)	PIN "PAD2" "D35" icl(158)	PIN "PAD876" "P39" icl(200)
PIN "PAD82" "B25" icl(117)	PIN "PAD8" "A36" icl(159)	PIN "PAD878" "P38" icl(201)
PIN "PAD83" "C25" icl(118)	PIN "PAD5" "B36" icl(160)	PIN "PAD893" "P37" icl(202)
PIN "PAD78" "D25" icl(119)	PIN "PAD959" "B37" icl(161)	PIN "PAD899" "P36" icl(203)
PIN "PAD77" "A26" icl(120)	PIN "PAD956" "C38" icl(162)	PIN "PAD864" "R39" icl(204)
PIN "PAD70" "B26" icl(121)	PIN "PAD946" "D39" icl(163)	PIN "PAD871" "R38" icl(205)
PIN "PAD76" "C26" icl(122)	PIN "PAD951" "D38" icl(164)	PIN "PAD885" "R37" icl(206)
PIN "PAD75" "D26" icl(123)	PIN "PAD953" "D37" icl(165)	PIN "PAD891" "R36" icl(207)
PIN "PAD68" "A27" icl(124)	PIN "PAD939" "E39" icl(166)	PIN "PAD856" "T39" icl(208)
PIN "PAD62" "B27" icl(125)	PIN "PAD944" "E38" icl(167)	PIN "PAD862" "T38" icl(209)
PIN "PAD69" "C27" icl(126)	PIN "PAD954" "E37" icl(168)	PIN "PAD877" "T37" icl(210)
PIN "PAD67" "D27" icl(127)	PIN "PAD932" "F39" icl(169)	PIN "PAD879" "T36" icl(211)
PIN "PAD60" "A28" icl(128)	PIN "PAD937" "F38" icl(170)	PIN "PAD849" "U39" icl(212)
PIN "PAD59" "B28" icl(129)	PIN "PAD948" "F37" icl(171)	PIN "PAD854" "U38" icl(213)
PIN "PAD61" "C28" icl(130)	PIN "PAD952" "F36" icl(172)	PIN "PAD869" "U37" icl(214)
PIN "PAD54" "A29" icl(131)	PIN "PAD929" "G39" icl(173)	PIN "PAD870" "U36" icl(215)
PIN "PAD55" "B29" icl(132)	PIN "PAD930" "G38" icl(174)	PIN "PAD872" "U35" icl(216)
PIN "PAD53" "C29" icl(133)	PIN "PAD943" "G37" icl(175)	PIN "PAD847" "V39" icl(217)
PIN "PAD48" "D29" icl(134)	PIN "PAD945" "G36" icl(176)	PIN "PAD853" "V38" icl(218)
PIN "PAD52" "A30" icl(135)	PIN "PAD921" "H39" icl(177)	PIN "PAD855" "V37" icl(219)
PIN "PAD47" "B30" icl(136)	PIN "PAD923" "H38" icl(178)	PIN "PAD861" "V36" icl(220)
PIN "PAD46" "C30" icl(137)	PIN "PAD936" "H37" icl(179)	PIN "PAD863" "V35" icl(221)
PIN "PAD40" "D30" icl(138)	PIN "PAD938" "H36" icl(180)	PIN "PAD840" "W39" icl(222)
PIN "PAD45" "A31" icl(139)	PIN "PAD913" "J39" icl(181)	PIN "PAD842" "W38" icl(223)
PIN "PAD38" "B31" icl(140)	PIN "PAD915" "J38" icl(182)	PIN "PAD846" "W37" icl(224)
PIN "PAD32" "C31" icl(141)	PIN "PAD924" "J37" icl(183)	PIN "PAD848" "W36" icl(225)
PIN "PAD30" "D31" icl(142)	PIN "PAD931" "J36" icl(184)	PIN "PAD833" "Y39" icl(226)
PIN "PAD39" "A32" icl(143)	PIN "PAD906" "K39" icl(185)	PIN "PAD828" "Y38" icl(227)
PIN "PAD37" "B32" icl(144)	PIN "PAD908" "K38" icl(186)	PIN "PAD826" "AA39" icl(228)
PIN "PAD29" "C32" icl(145)	PIN "PAD916" "K37" icl(187)	PIN "PAD820" "AA38" icl(229)
PIN "PAD24" "D32" icl(146)	PIN "PAD922" "K36" icl(188)	PIN "PAD841" "AA37" icl(230)
PIN "PAD31" "A33" icl(147)	PIN "PAD894" "L39" icl(189)	PIN "PAD835" "AA36" icl(231)
PIN "PAD25" "B33" icl(148)	PIN "PAD901" "L38" icl(190)	PIN "PAD818" "AB39" icl(232)
PIN "PAD22" "C33" icl(149)	PIN "PAD909" "L37" icl(191)	PIN "PAD812" "AB38" icl(233)

### A.1.3 Xilinx0 Filter Minne

PIN "PAD565" "AR17 fltmemif(0)	PIN "PAD533" "AU12 fltmemif(32)	PIN "PAD595" "AV19 fltmemif(64)
PIN "PAD577" "AR18 fltmemif(1)	PIN "PAD540" "AU13 fltmemif(33)	PIN "PAD607" "AV20 fltmemif(65)
PIN "PAD608" "AR22 fltmemif(2)	PIN "PAD547" "AU14 fltmemif(34)	PIN "PAD616" "AV21 fltmemif(66)
PIN "PAD623" "AR23 fltmemif(3)	PIN "PAD555" "AU15 fltmemif(35)	PIN "PAD624" "AV22 fltmemif(67)
PIN "PAD487" "AT6 fltmemif(4)	PIN "PAD563" "AU16 fltmemif(36)	PIN "PAD613" "AV23 fltmemif(68)
PIN "PAD495" "AT7 fltmemif(5)	PIN "PAD571" "AU17 fltmemif(37)	PIN "PAD629" "AV24 fltmemif(69)
PIN "PAD502" "AT8 fltmemif(6)	PIN "PAD585" "AU18 fltmemif(38)	PIN "PAD638" "AV25 fltmemif(70)
PIN "PAD509" "AT9 fltmemif(7)	PIN "PAD592" "AU19 fltmemif(39)	PIN "PAD645" "AV26 fltmemif(71)
PIN "PAD518" "AT10 fltmemif(8)	PIN "PAD594" "AU21 fltmemif(40)	PIN "PAD652" "AV27 fltmemif(72)
PIN "PAD526" "AT11 fltmemif(9)	PIN "PAD615" "AU23 fltmemif(41)	PIN "PAD660" "AV28 fltmemif(73)
PIN "PAD535" "AT13 fltmemif(10)	PIN "PAD632" "AU24 fltmemif(42)	PIN "PAD669" "AV29 fltmemif(74)
PIN "PAD541" "AT14 fltmemif(11)	PIN "PAD639" "AU25 fltmemif(43)	PIN "PAD490" "AW4 fltmemif(75)
PIN "PAD549" "AT15 fltmemif(12)	PIN "PAD651" "AU26 fltmemif(44)	PIN "PAD496" "AW5 fltmemif(76)
PIN "PAD558" "AT16 fltmemif(13)	PIN "PAD659" "AU27 fltmemif(45)	PIN "PAD503" "AW6 fltmemif(77)
PIN "PAD570" "AT17 fltmemif(14)	PIN "PAD667" "AU28 fltmemif(46)	PIN "PAD510" "AW7 fltmemif(78)
PIN "PAD579" "AT18 fltmemif(15)	PIN "PAD674" "AU29 fltmemif(47)	PIN "PAD517" "AW8 fltmemif(79)
PIN "PAD587" "AT19 fltmemif(16)	PIN "PAD485" "AV3 fltmemif(48)	PIN "PAD525" "AW9 fltmemif(80)
PIN "PAD600" "AT21 fltmemif(17)	PIN "PAD488" "AV4 fltmemif(49)	PIN "PAD532" "AW10 fltmemif(81)
PIN "PAD601" "AT22 fltmemif(18)	PIN "PAD482" "AV5 fltmemif(50)	PIN "PAD539" "AW11 fltmemif(82)
PIN "PAD621" "AT23 fltmemif(19)	PIN "PAD498" "AV6 fltmemif(51)	PIN "PAD548" "AW12 fltmemif(83)
PIN "PAD637" "AT24 fltmemif(20)	PIN "PAD505" "AV7 fltmemif(52)	PIN "PAD556" "AW13 fltmemif(84)
PIN "PAD644" "AT25 fltmemif(21)	PIN "PAD511" "AV8 fltmemif(53)	PIN "PAD562" "AW14 fltmemif(85)
PIN "PAD653" "AT26 fltmemif(22)	PIN "PAD519" "AV9 fltmemif(54)	PIN "PAD569" "AW15 fltmemif(86)
PIN "PAD662" "AT27 fltmemif(23)	PIN "PAD527" "AV10 fltmemif(55)	PIN "PAD578" "AW16 fltmemif(87)
PIN "PAD676" "AT29 fltmemif(24)	PIN "PAD534" "AV11 fltmemif(56)	PIN "PAD586" "AW17 fltmemif(88)
PIN "PAD481" "AU4 fltmemif(25)	PIN "PAD542" "AV12 fltmemif(57)	PIN "PAD593" "AW18 fltmemif(89)
PIN "PAD489" "AU6 fltmemif(26)	PIN "PAD550" "AV13 fltmemif(58)	PIN "PAD609" "AW20 fltmemif(90)
PIN "PAD497" "AU7 fltmemif(27)	PIN "PAD557" "AV14 fltmemif(59)	PIN "PAD614" "AW21 fltmemif(91)
PIN "PAD504" "AU8 fltmemif(28)	PIN "PAD564" "AV15 fltmemif(60)	PIN "PAD622" "AW22 fltmemif(92)
PIN "PAD512" "AU9 fltmemif(29)	PIN "PAD572" "AV16 fltmemif(61)	PIN "PAD630" "AW23 fltmemif(93)
PIN "PAD520" "AU10 fltmemif(30)	PIN "PAD580" "AV17 fltmemif(62)	PIN "PAD631" "AW24 fltmemif(94)
PIN "PAD528" "AU11 fltmemif(31)	PIN "PAD588" "AV18 fltmemif(63)	

### A.1.4 Xilinx0 localbus

PIN "PAD322" "P2 localbus (0)	PIN "PAD354" "AA4 localbus (27)	PIN "PAD428" "AJ1 localbus (54)
PIN "PAD329" "R2 localbus (1)	PIN "PAD384" "AB1 localbus (28)	PIN "PAD422" "AJ2 localbus (55)
PIN "PAD309" "R3 localbus (2)	PIN "PAD359" "AB2 localbus (29)	PIN "PAD427" "AJ3 localbus (56)
PIN "PAD307" "R4 localbus (3)	PIN "PAD361" "AB3 localbus (30)	PIN "PAD429" "AJ4 localbus (57)
PIN "PAD340" "T1 localbus (4)	PIN "PAD366" "AB4 localbus (31)	PIN "PAD433" "AK1 localbus (58)
PIN "PAD338" "T2 localbus (5)	PIN "PAD368" "AB5 localbus (32)	PIN "PAD435" "AK2 localbus (59)
PIN "PAD318" "T3 localbus (6)	PIN "PAD390" "AC1 localbus (33)	PIN "PAD434" "AK3 localbus (60)
PIN "PAD315" "T4 localbus (7)	PIN "PAD373" "AC2 localbus (34)	PIN "PAD436" "AK4 localbus (61)
PIN "PAD348" "U1 localbus (8)	PIN "PAD375" "AC3 localbus (35)	PIN "PAD441" "AL1 localbus (62)
PIN "PAD346" "U2 localbus (9)	PIN "PAD381" "AC4 localbus (36)	PIN "PAD442" "AL2 localbus (63)
PIN "PAD330" "U3 localbus (10)	PIN "PAD383" "AC5 localbus (37)	PIN "PAD444" "AL3 localbus (64)
PIN "PAD325" "U4 localbus (11)	PIN "PAD391" "AD1 localbus (38)	PIN "PAD450" "AL4 localbus (65)
PIN "PAD323" "U5 localbus (12)	PIN "PAD396" "AD2 localbus (39)	PIN "PAD443" "AM1 localbus (66)
PIN "PAD355" "V1 localbus (13)	PIN "PAD392" "AD4 localbus (40)	PIN "PAD449" "AM2 localbus (67)
PIN "PAD353" "V2 localbus (14)	PIN "PAD398" "AE1 localbus (41)	PIN "PAD451" "AM3 localbus (68)
PIN "PAD339" "V3 localbus (15)	PIN "PAD403" "AE2 localbus (42)	PIN "PAD456" "AM4 localbus (69)
PIN "PAD337" "V4 localbus (16)	PIN "PAD397" "AE3 localbus (43)	PIN "PAD452" "AN1 localbus (70)
PIN "PAD331" "V5 localbus (17)	PIN "PAD399" "AE4 localbus (44)	PIN "PAD458" "AN2 localbus (71)
PIN "PAD367" "W1 localbus (18)	PIN "PAD406" "AF1 localbus (45)	PIN "PAD463" "AN3 localbus (72)
PIN "PAD360" "W2 localbus (19)	PIN "PAD412" "AF2 localbus (46)	PIN "PAD457" "AP1 localbus (74)
PIN "PAD347" "W3 localbus (20)	PIN "PAD404" "AF3 localbus (47)	PIN "PAD468" "AP3 localbus (76)
PIN "PAD345" "W4 localbus (21)	PIN "PAD405" "AF4 localbus (48)	PIN "PAD459" "AP2 localbus (77)
PIN "PAD374" "Y1 localbus (22)	PIN "PAD414" "AG1 localbus (49)	PIN "PAD464" "AR1 localbus (78)
PIN "PAD369" "Y2 localbus (23)	PIN "PAD411" "AG3 localbus (50)	PIN "PAD471" "AR2 localbus (79)
PIN "PAD376" "AA1 localbus (24)	PIN "PAD413" "AG4 localbus (51)	PIN "PAD474" "AR3 localbus (80)
PIN "PAD382" "AA2 localbus (25)	PIN "PAD426" "AH2 localbus (52)	PIN "PAD466" "AT1 localbus (81)
PIN "PAD352" "AA3 localbus (26)	PIN "PAD419" "AH3 localbus (53)	

### A.1.5 Xilinx0 klokkepinner

PIN "GCK0" "AW19 clk\_bus (0)  
 PIN "GCK1" "AU22 clk\_bus (3)  
 PIN "GCK2" "D21 memclk\_fb0  
 PIN "GCK3" "A20 clk\_bus (9)  
 PIN "PAD819" "AC36" memclk\_out0

### A.1.6 Xilinx0 testpinner

PIN "PAD465" "AN4 tp000	PIN "D7" "AR4" tp008	PIN "PAD684" "AT30" tp016
PIN "PAD472" "AP4 tp001	PIN "WRITE" "B4" tp009	PIN "PAD661" "AW29" tp017
PIN "D1" "P4" tp002	PIN "CS" "D5" tp010	PIN "PAD654" "AW28" tp018
PIN "D2" "P3" tp003	PIN "PAD473" "AT2" tp011	PIN "PAD646" "AW27" tp019
PIN "D3" "R1" tp004	PIN "PAD476" "AT3" tp012	PIN "BUSY_DOUT" "E3" tp020
PIN "D4" "AD3" tp005	PIN "PAD834" "AB37" tp013	PIN "PAD817" "AC35" tp021
PIN "D5" "AG2" tp006	PIN "PAD832" "AB36" tp014	PIN "PAD643" "AW26" tp022
PIN "D6" "AH1" tp007	PIN "PAD827" "AB35" tp015	PIN "PAD636" "AW25" tp023

### A.1.7 Xilinx0 prom, jtag, mode og temperaturdioder

Kobling til init prom og JTAG

PIN "ERR\_INIT" "AU2 init1#  
 PIN "DONE" "AU5 done1  
 PIN "TDO" "C4 tdoxilinx#1  
 PIN "D0\_DIN" "C2 din1  
 PIN "TCK" "C36 jtag (0)  
 PIN "TMS" "E36 jtag (1)

PIN "TDI" "B3 tdopromsh3  
 PIN "CCLK" "E4 cclk1  
 PIN "PROGRAM" "AT5 program#

Intern 'mode' setting

PIN "M0" "AT37 m0 (gnd)  
 PIN "M1" "AU38 m1 (gnd)  
 PIN "M2" "AT35 m2 (gnd)

Kobling til temperaturdioden

PIN temp\_anode AU35  
 temp\_pos  
 pin temp\_katode AV37  
 temp\_neg

## A.2 Xilinx1

### A.2.1 Xilinx1 'Inter Connect' pinner til Xilinx0

PIN "PAD404" "AF3" ic1 (0)	PIN "PAD422" "AJ2" ic1 (8)	PIN "PAD442" "AL2" ic1 (16)
PIN "PAD405" "AF4" ic1 (1)	PIN "PAD427" "AJ3" ic1 (9)	PIN "PAD444" "AL3" ic1 (17)
PIN "PAD414" "AG1" ic1 (2)	PIN "PAD429" "AJ4" ic1 (10)	PIN "PAD450" "AL4" ic1 (18)
PIN "PAD411" "AG3" ic1 (3)	PIN "PAD433" "AK1" ic1 (11)	PIN "PAD443" "AM1" ic1 (19)
PIN "PAD413" "AG4" ic1 (4)	PIN "PAD435" "AK2" ic1 (12)	PIN "PAD449" "AM2" ic1 (20)
PIN "PAD426" "AH2" ic1 (5)	PIN "PAD434" "AK3" ic1 (13)	PIN "PAD451" "AM3" ic1 (21)
PIN "PAD419" "AH3" ic1 (6)	PIN "PAD436" "AK4" ic1 (14)	PIN "PAD456" "AM4" ic1 (22)
PIN "PAD428" "AJ1" ic1 (7)	PIN "PAD441" "AL1" ic1 (15)	PIN "PAD452" "AN1" ic1 (23)

PIN "PAD458" "AN2" ic1 (24)	PIN "PAD579" "AT18" ic1 (94)	PIN "PAD733" "AR39" ic1 (164)
PIN "PAD463" "AN3" ic1 (25)	PIN "PAD577" "AR18" ic1 (95)	PIN "PAD727" "AR38" ic1 (165)
PIN "PAD465" "AN4" ic1 (26)	PIN "PAD595" "AV19" ic1 (96)	PIN "PAD725" "AR37" ic1 (166)
PIN "PAD457" "AP1" ic1 (27)	PIN "PAD592" "AU19" ic1 (97)	PIN "PAD721" "AR36" ic1 (167)
PIN "PAD459" "AP2" ic1 (28)	PIN "PAD587" "AT19" ic1 (98)	PIN "PAD736" "AP39" ic1 (168)
PIN "PAD468" "AP3" ic1 (29)	PIN "PAD609" "AW20" ic1 (99)	PIN "PAD735" "AP38" ic1 (169)
PIN "PAD472" "AP4" ic1 (30)	PIN "PAD607" "AV20" ic1 (100)	PIN "PAD730" "AP37" ic1 (170)
PIN "PAD464" "AR1" ic1 (31)	PIN "PAD614" "AW21" ic1 (101)	PIN "PAD728" "AP36" ic1 (171)
PIN "PAD471" "AR2" ic1 (32)	PIN "PAD616" "AV21" ic1 (102)	PIN "PAD743" "AN39" ic1 (172)
PIN "PAD474" "AR3" ic1 (33)	PIN "PAD601" "AU21" ic1 (103)	PIN "PAD738" "AN38" ic1 (173)
PIN "PAD466" "AT1" ic1 (34)	PIN "PAD600" "AT21" ic1 (104)	PIN "PAD742" "AN37" ic1 (174)
PIN "PAD473" "AT2" ic1 (35)	PIN "PAD622" "AW22" ic1 (105)	PIN "PAD737" "AN36" ic1 (175)
PIN "PAD476" "AT3" ic1 (36)	PIN "PAD624" "AV22" ic1 (106)	PIN "PAD751" "AM39" ic1 (176)
PIN "PAD485" "AV3" ic1 (37)	PIN "PAD601" "AU22" ic1 (107)	PIN "PAD745" "AM38" ic1 (177)
PIN "PAD490" "AW4" ic1 (38)	PIN "PAD608" "AR22" ic1 (108)	PIN "PAD749" "AM37" ic1 (178)
PIN "PAD488" "AV4" ic1 (39)	PIN "PAD630" "AW23" ic1 (109)	PIN "PAD744" "AM36" ic1 (179)
PIN "PAD481" "AU4" ic1 (40)	PIN "PAD613" "AV23" ic1 (110)	PIN "PAD759" "AL39" ic1 (180)
PIN "PAD496" "AW5" ic1 (41)	PIN "PAD615" "AU23" ic1 (111)	PIN "PAD757" "AL38" ic1 (181)
PIN "PAD482" "AV5" ic1 (42)	PIN "PAD621" "AT23" ic1 (112)	PIN "PAD752" "AL37" ic1 (182)
PIN "PAD503" "AW6" ic1 (43)	PIN "PAD623" "AR23" ic1 (113)	PIN "PAD750" "AL36" ic1 (183)
PIN "PAD498" "AV6" ic1 (44)	PIN "PAD631" "AW24" ic1 (114)	PIN "PAD767" "AK39" ic1 (184)
PIN "PAD489" "AU6" ic1 (45)	PIN "PAD629" "AU24" ic1 (115)	PIN "PAD765" "AK38" ic1 (185)
PIN "PAD487" "AT6" ic1 (46)	PIN "PAD632" "AU24" ic1 (116)	PIN "PAD760" "AK37" ic1 (186)
PIN "PAD510" "AW7" ic1 (47)	PIN "PAD637" "AT24" ic1 (117)	PIN "PAD758" "AK36" ic1 (187)
PIN "PAD505" "AV7" ic1 (48)	PIN "PAD636" "AW25" ic1 (118)	PIN "PAD774" "AJ39" ic1 (188)
PIN "PAD497" "AU7" ic1 (49)	PIN "PAD638" "AV25" ic1 (119)	PIN "PAD772" "AJ38" ic1 (189)
PIN "PAD495" "AT7" ic1 (50)	PIN "PAD639" "AU25" ic1 (120)	PIN "PAD768" "AJ37" ic1 (190)
PIN "PAD517" "AW8" ic1 (51)	PIN "PAD644" "AT25" ic1 (121)	PIN "PAD766" "AJ36" ic1 (191)
PIN "PAD511" "AV8" ic1 (52)	PIN "PAD643" "AW26" ic1 (122)	PIN "PAD779" "AH39" ic1 (192)
PIN "PAD504" "AU8" ic1 (53)	PIN "PAD645" "AV26" ic1 (123)	PIN "PAD775" "AH38" ic1 (193)
PIN "PAD502" "AT8" ic1 (54)	PIN "PAD651" "AU26" ic1 (124)	PIN "PAD773" "AH37" ic1 (194)
PIN "PAD525" "AW9" ic1 (55)	PIN "PAD653" "AT26" ic1 (125)	PIN "PAD782" "AG39" ic1 (195)
PIN "PAD519" "AV9" ic1 (56)	PIN "PAD646" "AW27" ic1 (126)	PIN "PAD780" "AG38" ic1 (196)
PIN "PAD512" "AU9" ic1 (57)	PIN "PAD652" "AV27" ic1 (127)	PIN "PAD787" "AG37" ic1 (197)
PIN "PAD509" "AT9" ic1 (58)	PIN "PAD659" "AU27" ic1 (128)	PIN "PAD781" "AG36" ic1 (198)
PIN "PAD532" "AW10" ic1 (59)	PIN "PAD662" "AT27" ic1 (129)	PIN "PAD788" "AF39" ic1 (199)
PIN "PAD527" "AV10" ic1 (60)	PIN "PAD654" "AW28" ic1 (130)	PIN "PAD796" "AF38" ic1 (200)
PIN "PAD520" "AU10" ic1 (61)	PIN "PAD660" "AV28" ic1 (131)	PIN "PAD795" "AF37" ic1 (201)
PIN "PAD518" "AT10" ic1 (62)	PIN "PAD667" "AU28" ic1 (132)	PIN "PAD789" "AF36" ic1 (202)
PIN "PAD539" "AW11" ic1 (63)	PIN "PAD661" "AW29" ic1 (133)	PIN "PAD797" "AE39" ic1 (203)
PIN "PAD534" "AV11" ic1 (64)	PIN "PAD669" "AV29" ic1 (134)	PIN "PAD790" "AE38" ic1 (204)
PIN "PAD528" "AU11" ic1 (65)	PIN "PAD674" "AU29" ic1 (135)	PIN "PAD803" "AE37" ic1 (205)
PIN "PAD526" "AT11" ic1 (66)	PIN "PAD676" "AT29" ic1 (136)	PIN "PAD798" "AE36" ic1 (206)
PIN "PAD548" "AW12" ic1 (67)	PIN "PAD666" "AW30" ic1 (137)	PIN "PAD804" "AD39" ic1 (207)
PIN "PAD542" "AV12" ic1 (68)	PIN "PAD668" "AV30" ic1 (138)	PIN "PAD802" "AD38" ic1 (208)
PIN "PAD533" "AU12" ic1 (69)	PIN "PAD682" "AU30" ic1 (139)	PIN "PAD811" "AD37" ic1 (209)
PIN "PAD556" "AW13" ic1 (70)	PIN "PAD684" "AT30" ic1 (140)	PIN "PAD805" "AD36" ic1 (210)
PIN "PAD550" "AV13" ic1 (71)	PIN "PAD673" "AW31" ic1 (141)	PIN "PAD810" "AC39" ic1 (211)
PIN "PAD540" "AU13" ic1 (72)	PIN "PAD675" "AV31" ic1 (142)	PIN "PAD809" "AC38" ic1 (212)
PIN "PAD535" "AT13" ic1 (73)	PIN "PAD690" "AU31" ic1 (143)	PIN "PAD825" "AC37" ic1 (213)
PIN "PAD562" "AW14" ic1 (74)	PIN "PAD691" "AT31" ic1 (144)	PIN "PAD819" "AC36" ic1 (214)
PIN "PAD557" "AV14" ic1 (75)	PIN "PAD681" "AW32" ic1 (145)	PIN "PAD817" "AC35" ic1 (215)
PIN "PAD547" "AU14" ic1 (76)	PIN "PAD696" "AV32" ic1 (146)	PIN "PAD818" "AB39" ic1 (216)
PIN "PAD541" "AT14" ic1 (77)	PIN "PAD698" "AU32" ic1 (147)	PIN "PAD812" "AB38" ic1 (217)
PIN "PAD569" "AW15" ic1 (78)	PIN "PAD703" "AT32" ic1 (148)	PIN "PAD834" "AB37" ic1 (218)
PIN "PAD564" "AV15" ic1 (79)	PIN "PAD683" "AW33" ic1 (149)	PIN "PAD832" "AB36" ic1 (219)
PIN "PAD555" "AU15" ic1 (80)	PIN "PAD689" "AV33" ic1 (150)	PIN "PAD827" "AB35" ic1 (220)
PIN "PAD549" "AT15" ic1 (81)	PIN "PAD705" "AU33" ic1 (151)	PIN "PAD826" "AA39" ic1 (221)
PIN "PAD578" "AW16" ic1 (82)	PIN "PAD711" "AT33" ic1 (152)	PIN "PAD820" "AA38" ic1 (222)
PIN "PAD572" "AV16" ic1 (83)	PIN "PAD692" "AW34" ic1 (153)	PIN "PAD841" "AA37" ic1 (223)
PIN "PAD563" "AU16" ic1 (84)	PIN "PAD697" "AV34" ic1 (154)	PIN "PAD835" "AA36" ic1 (224)
PIN "PAD558" "AT16" ic1 (85)	PIN "PAD713" "AU34" ic1 (155)	PIN "PAD833" "Y39" ic1 (225)
PIN "PAD586" "AW17" ic1 (86)	PIN "PAD716" "AT34" ic1 (156)	PIN "PAD828" "Y38" ic1 (226)
PIN "PAD580" "AV17" ic1 (87)	PIN "PAD699" "AW35" ic1 (157)	PIN "PAD840" "W39" ic1 (227)
PIN "PAD571" "AU17" ic1 (88)	PIN "PAD704" "AV35" ic1 (158)	PIN "PAD842" "W38" ic1 (228)
PIN "PAD570" "AT17" ic1 (89)	PIN "PAD706" "AW36" ic1 (159)	PIN "PAD846" "W37" ic1 (229)
PIN "PAD565" "AR17" ic1 (90)	PIN "PAD712" "AV36" ic1 (160)	PIN "PAD848" "W36" ic1 (230)
PIN "PAD593" "AW18" ic1 (91)	PIN "PAD714" "AU36" ic1 (161)	PIN "PAD847" "V39" ic1 (231)
PIN "PAD588" "AV18" ic1 (92)	PIN "PAD729" "AT39" ic1 (162)	PIN "PAD853" "V38" ic1 (232)
PIN "PAD585" "AU18" ic1 (93)	PIN "PAD722" "AT38" ic1 (163)	PIN "PAD855" "V37" ic1 (233)

## A.2.2 Xilinx1 'Inter Connect' pinner til Xilinx3

PIN "PAD234" "A4" ic2 (0)	PIN "PAD233" "D6" ic2 (7)	PIN "PAD216" "C8" ic2 (14)
PIN "PAD226" "A5" ic2 (1)	PIN "PAD212" "A7" ic2 (8)	PIN "PAD218" "D8" ic2 (15)
PIN "PAD232" "B5" ic2 (2)	PIN "PAD217" "B7" ic2 (9)	PIN "PAD201" "A9" ic2 (16)
PIN "PAD236" "C5" ic2 (3)	PIN "PAD223" "C7" ic2 (10)	PIN "PAD203" "B9" ic2 (17)
PIN "PAD219" "A6" ic2 (4)	PIN "PAD225" "D7" ic2 (11)	PIN "PAD204" "C9" ic2 (18)
PIN "PAD224" "B6" ic2 (5)	PIN "PAD209" "A8" ic2 (12)	PIN "PAD211" "D9" ic2 (19)
PIN "PAD231" "C6" ic2 (6)	PIN "PAD210" "B8" ic2 (13)	PIN "PAD193" "A10" ic2 (20)

PIN "PAD195" "B10" ic2 (21)	PIN "PAD127" "B19" ic2 (58)	PIN "PAD55" "B29" ic2 (95)
PIN "PAD196" "C10" ic2 (22)	PIN "PAD128" "C19" ic2 (59)	PIN "PAD53" "C29" ic2 (96)
PIN "PAD202" "D10" ic2 (23)	PIN "PAD133" "D19" ic2 (60)	PIN "PAD48" "D29" ic2 (97)
PIN "PAD186" "A11" ic2 (24)	PIN "PAD113" "B20" ic2 (61)	PIN "PAD52" "A30" ic2 (98)
PIN "PAD188" "B11" ic2 (25)	PIN "PAD108" "A21" ic2 (62)	PIN "PAD47" "B30" ic2 (99)
PIN "PAD189" "C11" ic2 (26)	PIN "PAD106" "B21" ic2 (63)	PIN "PAD46" "C30" ic2 (100)
PIN "PAD194" "D11" ic2 (27)	PIN "PAD126" "C21" ic2 (64)	PIN "PAD40" "D30" ic2 (101)
PIN "PAD174" "A12" ic2 (28)	PIN "PAD100" "A22" ic2 (65)	PIN "PAD45" "A31" ic2 (102)
PIN "PAD181" "B12" ic2 (29)	PIN "PAD98" "B22" ic2 (66)	PIN "PAD38" "B31" ic2 (103)
PIN "PAD187" "C12" ic2 (30)	PIN "PAD120" "C22" ic2 (67)	PIN "PAD32" "C31" ic2 (104)
PIN "PAD166" "A13" ic2 (31)	PIN "PAD114" "D22" ic2 (68)	PIN "PAD30" "D31" ic2 (105)
PIN "PAD172" "B13" ic2 (32)	PIN "PAD112" "E22" ic2 (69)	PIN "PAD39" "A32" ic2 (106)
PIN "PAD180" "C13" ic2 (33)	PIN "PAD92" "A23" ic2 (70)	PIN "PAD37" "B32" ic2 (107)
PIN "PAD182" "D13" ic2 (34)	PIN "PAD90" "B23" ic2 (71)	PIN "PAD29" "C32" ic2 (108)
PIN "PAD163" "A14" ic2 (35)	PIN "PAD107" "C23" ic2 (72)	PIN "PAD24" "D32" ic2 (109)
PIN "PAD164" "B14" ic2 (36)	PIN "PAD105" "D23" ic2 (73)	PIN "PAD31" "A33" ic2 (110)
PIN "PAD173" "C14" ic2 (37)	PIN "PAD99" "E23" ic2 (74)	PIN "PAD25" "B33" ic2 (111)
PIN "PAD179" "D14" ic2 (38)	PIN "PAD89" "A24" ic2 (75)	PIN "PAD22" "C33" ic2 (112)
PIN "PAD156" "A15" ic2 (39)	PIN "PAD97" "B24" ic2 (76)	PIN "PAD17" "D33" ic2 (113)
PIN "PAD158" "B15" ic2 (40)	PIN "PAD91" "C24" ic2 (77)	PIN "PAD23" "A34" ic2 (114)
PIN "PAD165" "C15" ic2 (41)	PIN "PAD85" "D24" ic2 (78)	PIN "PAD18" "B34" ic2 (115)
PIN "PAD171" "D15" ic2 (42)	PIN "PAD84" "A25" ic2 (79)	PIN "PAD15" "C34" ic2 (116)
PIN "PAD144" "A16" ic2 (43)	PIN "PAD82" "B25" ic2 (80)	PIN "PAD9" "D34" ic2 (117)
PIN "PAD151" "B16" ic2 (44)	PIN "PAD83" "C25" ic2 (81)	PIN "PAD16" "A35" ic2 (118)
PIN "PAD157" "C16" ic2 (45)	PIN "PAD78" "D25" ic2 (82)	PIN "PAD10" "B35" ic2 (119)
PIN "PAD159" "D16" ic2 (46)	PIN "PAD77" "A26" ic2 (83)	PIN "PAD7" "C35" ic2 (120)
PIN "PAD136" "A17" ic2 (47)	PIN "PAD70" "B26" ic2 (84)	PIN "PAD2" "D35" ic2 (121)
PIN "PAD142" "B17" ic2 (48)	PIN "PAD76" "C26" ic2 (85)	PIN "PAD8" "A36" ic2 (122)
PIN "PAD149" "C17" ic2 (49)	PIN "PAD75" "D26" ic2 (86)	PIN "PAD5" "B36" ic2 (123)
PIN "PAD150" "D17" ic2 (50)	PIN "PAD68" "A27" ic2 (87)	PIN "PAD959" "B37" ic2 (124)
PIN "PAD152" "E17" ic2 (51)	PIN "PAD62" "B27" ic2 (88)	PIN "PAD956" "C38" ic2 (125)
PIN "PAD129" "A18" ic2 (52)	PIN "PAD69" "C27" ic2 (89)	PIN "PAD946" "D39" ic2 (126)
PIN "PAD134" "B18" ic2 (53)	PIN "PAD67" "D27" ic2 (90)	PIN "PAD951" "D38" ic2 (127)
PIN "PAD135" "C18" ic2 (54)	PIN "PAD59" "B28" ic2 (91)	PIN "PAD953" "D37" ic2 (128)
PIN "PAD141" "D18" ic2 (55)	PIN "PAD60" "A28" ic2 (92)	PIN "PAD939" "E39" ic2 (129)
PIN "PAD143" "E18" ic2 (56)	PIN "PAD61" "C28" ic2 (93)	PIN "PAD944" "E38" ic2 (130)
PIN "PAD121" "A19" ic2 (57)	PIN "PAD54" "A29" ic2 (94)	PIN "PAD954" "E37" ic2 (131)

### A.2.3 Xilinx1 localbus

PIN "PAD253" "D1" localbus (0)	PIN "PAD286" "L3" localbus (27)	PIN "PAD331" "V5" localbus (54)
PIN "PAD249" "D2" localbus (1)	PIN "PAD280" "L4" localbus (28)	PIN "PAD367" "W1" localbus (55)
PIN "PAD247" "D3" localbus (2)	PIN "PAD310" "M1" localbus (29)	PIN "PAD360" "W2" localbus (56)
PIN "PAD258" "E1" localbus (3)	PIN "PAD308" "M2" localbus (30)	PIN "PAD347" "W3" localbus (57)
PIN "PAD256" "E2" localbus (4)	PIN "PAD288" "M3" localbus (31)	PIN "PAD345" "W4" localbus (58)
PIN "PAD265" "F1" localbus (5)	PIN "PAD317" "N1" localbus (32)	PIN "PAD374" "Y1" localbus (59)
PIN "PAD263" "F2" localbus (6)	PIN "PAD316" "N2" localbus (33)	PIN "PAD369" "Y2" localbus (60)
PIN "PAD248" "F3" localbus (7)	PIN "PAD295" "N3" localbus (34)	PIN "PAD376" "AA1" localbus (61)
PIN "PAD245" "F4" localbus (8)	PIN "PAD293" "N4" localbus (35)	PIN "PAD382" "AA2" localbus (62)
PIN "PAD271" "G1" localbus (9)	PIN "PAD324" "P1" localbus (36)	PIN "PAD352" "AA3" localbus (63)
PIN "PAD270" "G2" localbus (10)	PIN "PAD322" "P2" localbus (37)	PIN "PAD354" "AA4" localbus (64)
PIN "PAD255" "G3" localbus (11)	PIN "PAD329" "R2" localbus (38)	PIN "PAD384" "AB1" localbus (65)
PIN "PAD250" "G4" localbus (12)	PIN "PAD309" "R3" localbus (39)	PIN "PAD359" "AB2" localbus (66)
PIN "PAD279" "H1" localbus (13)	PIN "PAD307" "R4" localbus (40)	PIN "PAD361" "AB3" localbus (67)
PIN "PAD277" "H2" localbus (14)	PIN "PAD340" "T1" localbus (41)	PIN "PAD366" "AB4" localbus (68)
PIN "PAD262" "H3" localbus (15)	PIN "PAD338" "T2" localbus (42)	PIN "PAD368" "AB5" localbus (69)
PIN "PAD257" "H4" localbus (16)	PIN "PAD318" "T3" localbus (43)	PIN "PAD390" "AC1" localbus (70)
PIN "PAD287" "J1" localbus (17)	PIN "PAD315" "T4" localbus (44)	PIN "PAD373" "AC2" localbus (71)
PIN "PAD285" "J2" localbus (18)	PIN "PAD348" "U1" localbus (45)	PIN "PAD375" "AC3" localbus (72)
PIN "PAD269" "J3" localbus (19)	PIN "PAD346" "U2" localbus (46)	PIN "PAD383" "AC5" localbus (74)
PIN "PAD264" "J4" localbus (20)	PIN "PAD330" "U3" localbus (47)	PIN "PAD396" "AD2" localbus (76)
PIN "PAD294" "K1" localbus (21)	PIN "PAD325" "U4" localbus (48)	PIN "PAD391" "AD1" localbus (77)
PIN "PAD292" "K2" localbus (22)	PIN "PAD323" "U5" localbus (49)	PIN "PAD398" "AE1" localbus (78)
PIN "PAD278" "K3" localbus (23)	PIN "PAD355" "V1" localbus (50)	PIN "PAD403" "AE2" localbus (79)
PIN "PAD272" "K4" localbus (24)	PIN "PAD353" "V2" localbus (51)	PIN "PAD397" "AE3" localbus (80)
PIN "PAD302" "L1" localbus (25)	PIN "PAD339" "V3" localbus (52)	PIN "PAD399" "AE4" localbus (81)
PIN "PAD299" "L2" localbus (26)	PIN "PAD337" "V4" localbus (53)	

### A.2.4 Xilinx1 bakplan bus

PIN "PAD945" "G36" bp_bus (0)	PIN "PAD906" "K39" bp_bus (9)	PIN "PAD892" "M38" bp_bus (18)
PIN "PAD921" "H39" bp_bus (1)	PIN "PAD908" "K38" bp_bus (10)	PIN "PAD907" "M37" bp_bus (19)
PIN "PAD923" "H38" bp_bus (2)	PIN "PAD916" "K37" bp_bus (11)	PIN "PAD883" "N39" bp_bus (20)
PIN "PAD936" "H37" bp_bus (3)	PIN "PAD922" "K36" bp_bus (12)	PIN "PAD884" "N38" bp_bus (21)
PIN "PAD938" "H36" bp_bus (4)	PIN "PAD894" "L39" bp_bus (13)	PIN "PAD900" "N37" bp_bus (22)
PIN "PAD913" "J39" bp_bus (5)	PIN "PAD901" "L38" bp_bus (14)	PIN "PAD902" "N36" bp_bus (23)
PIN "PAD915" "J38" bp_bus (6)	PIN "PAD909" "L37" bp_bus (15)	PIN "PAD876" "P39" bp_bus (24)
PIN "PAD924" "J37" bp_bus (7)	PIN "PAD914" "L36" bp_bus (16)	PIN "PAD878" "P38" bp_bus (25)
PIN "PAD931" "J36" bp_bus (8)	PIN "PAD886" "M39" bp_bus (17)	PIN "PAD893" "P37" bp_bus (26)

PIN "PAD899" "P36" bp_bus(27)	PIN "PAD891" "R36" bp_bus(31)	PIN "PAD879" "T36" bp_bus(35)
PIN "PAD864" "R39" bp_bus(28)	PIN "PAD856" "T39" bp_bus(32)	PIN "PAD872" "U35" bp_bus(36)
PIN "PAD871" "R38" bp_bus(29)	PIN "PAD862" "T38" bp_bus(33)	PIN "PAD932" "F39" bp_bus(37)
PIN "PAD885" "R37" bp_bus(30)	PIN "PAD877" "T37" bp_bus(34)	PIN "PAD937" "F38" bp_bus(38)

## A.2.5 Xilinx1 klokkepinner

PIN "GCK0" "AW19" clk\_bus(1)  
 PIN "GCK1" "AU22" clk\_bus(4)  
 PIN "GCK3" "A20" clk\_bus(10)

## A.2.6 Xilinx1 testpinner

PIN "PAD381" "AC4" tp100	PIN "D6" "AH1" tp109	PIN "PAD870" "U36" tp118
PIN "PAD392" "AD4" tp101	PIN "D7" "AR4" tp110	PIN "PAD869" "U37" tp119
PIN "PAD406" "AF1" tp102	PIN "WRITE" "B4" tp111	PIN "PAD863" "V35" tp120
PIN "PAD412" "AF2" tp103	PIN "CS" "D5" tp112	PIN "PAD861" "V36" tp121
PIN "D1" "P4" tp104	PIN "PAD952" "F36" tp113	PIN "PAD854" "U38" tp122
PIN "D2" "P3" tp105	PIN "PAD948" "F37" tp114	PIN "PAD849" "U39" tp123
PIN "D3" "R1" tp106	PIN "PAD943" "G37" tp115	PIN "BUSY_DOUT" "E3" tp124
PIN "D4" "AD3" tp107	PIN "PAD930" "G38" tp116	PIN "GCK2" "D21" tp125
PIN "D5" "AG2" tp108	PIN "PAD929" "G39" tp117	

## A.2.7 Xilinx1 prom, jtag, mode og temperaturdioder

Kobling til init prom og JTAG	PIN "CCLK" "E4" cclk2 PIN "PROGRAM" "AT5" program#	Kobling til temperaturdioden
PIN "ERR_INIT" "AU2" init2# PIN "DONE" "AU5" done2 PIN "TDO" "C4" tdoxilinx#2 PIN "D0 DIN" "C2" din2 PIN "TCK" "C36" jtag(0) PIN "TMS" "E36" jtag(1) PIN "TDI" "B3" tdoxilinx#1	Intern 'mode' setting  PIN "M0" "AT37" m0 (gnd) PIN "M1" "AU38" m1 (gnd) PIN "M2" "AT35" m2 (gnd)	PIN temp_anode AU35 temp_pos pin temp_katode AV37 temp_neg

## A.3 Xilinx2

### A.3.1 Xilinx2 'Inter Connect' pinner til Xilinx1

PIN "PAD855" "V37" ic2(0)	PIN "PAD669" "AV29" ic2(34)	PIN "PAD736" "AP39" ic2(68)
PIN "PAD609" "AW20" ic2(1)	PIN "PAD674" "AU29" ic2(35)	PIN "PAD735" "AP38" ic2(69)
PIN "PAD607" "AV20" ic2(2)	PIN "PAD676" "AT29" ic2(36)	PIN "PAD730" "AP37" ic2(70)
PIN "PAD614" "AW21" ic2(3)	PIN "PAD666" "AW30" ic2(37)	PIN "PAD728" "AP36" ic2(71)
PIN "PAD616" "AV21" ic2(4)	PIN "PAD668" "AV30" ic2(38)	PIN "PAD743" "AN39" ic2(72)
PIN "PAD622" "AW22" ic2(5)	PIN "PAD682" "AU30" ic2(39)	PIN "PAD738" "AN38" ic2(73)
PIN "PAD624" "AV22" ic2(6)	PIN "PAD684" "AT30" ic2(40)	PIN "PAD742" "AN37" ic2(74)
PIN "PAD601" "AR22" ic2(7)	PIN "PAD673" "AW31" ic2(41)	PIN "PAD737" "AN36" ic2(75)
PIN "PAD608" "AR22" ic2(8)	PIN "PAD675" "AV31" ic2(42)	PIN "PAD751" "AM39" ic2(76)
PIN "PAD630" "AW23" ic2(9)	PIN "PAD690" "AU31" ic2(43)	PIN "PAD745" "AM38" ic2(77)
PIN "PAD613" "AV23" ic2(10)	PIN "PAD691" "AT31" ic2(44)	PIN "PAD749" "AM37" ic2(78)
PIN "PAD615" "AU23" ic2(11)	PIN "PAD681" "AW32" ic2(45)	PIN "PAD744" "AM36" ic2(79)
PIN "PAD621" "AT23" ic2(12)	PIN "PAD696" "AV32" ic2(46)	PIN "PAD759" "AL39" ic2(80)
PIN "PAD623" "AR23" ic2(13)	PIN "PAD698" "AU32" ic2(47)	PIN "PAD757" "AL38" ic2(81)
PIN "PAD631" "AW24" ic2(14)	PIN "PAD703" "AT32" ic2(48)	PIN "PAD752" "AL37" ic2(82)
PIN "PAD629" "AV24" ic2(15)	PIN "PAD683" "AW33" ic2(49)	PIN "PAD750" "AL36" ic2(83)
PIN "PAD632" "AU24" ic2(16)	PIN "PAD689" "AV33" ic2(50)	PIN "PAD767" "AK39" ic2(84)
PIN "PAD637" "AT24" ic2(17)	PIN "PAD705" "AU33" ic2(51)	PIN "PAD765" "AK38" ic2(85)
PIN "PAD636" "AW25" ic2(18)	PIN "PAD711" "AT33" ic2(52)	PIN "PAD760" "AK37" ic2(86)
PIN "PAD638" "AV25" ic2(19)	PIN "PAD692" "AW34" ic2(53)	PIN "PAD758" "AK36" ic2(87)
PIN "PAD639" "AU25" ic2(20)	PIN "PAD697" "AV34" ic2(54)	PIN "PAD774" "AJ39" ic2(88)
PIN "PAD644" "AT25" ic2(21)	PIN "PAD713" "AU34" ic2(55)	PIN "PAD772" "AJ38" ic2(89)
PIN "PAD643" "AW26" ic2(22)	PIN "PAD716" "AT34" ic2(56)	PIN "PAD768" "AJ37" ic2(90)
PIN "PAD645" "AV26" ic2(23)	PIN "PAD699" "AW35" ic2(57)	PIN "PAD766" "AJ36" ic2(91)
PIN "PAD651" "AU26" ic2(24)	PIN "PAD704" "AV35" ic2(58)	PIN "PAD779" "AH39" ic2(92)
PIN "PAD653" "AT26" ic2(25)	PIN "PAD706" "AW36" ic2(59)	PIN "PAD775" "AH38" ic2(93)
PIN "PAD646" "AW27" ic2(26)	PIN "PAD712" "AV36" ic2(60)	PIN "PAD773" "AH37" ic2(94)
PIN "PAD652" "AV27" ic2(27)	PIN "PAD714" "AU36" ic2(61)	PIN "PAD782" "AG39" ic2(95)
PIN "PAD659" "AU27" ic2(28)	PIN "PAD729" "AT39" ic2(62)	PIN "PAD780" "AG38" ic2(96)
PIN "PAD662" "AT27" ic2(29)	PIN "PAD722" "AT38" ic2(63)	PIN "PAD787" "AG37" ic2(97)
PIN "PAD654" "AW28" ic2(30)	PIN "PAD733" "AR39" ic2(64)	PIN "PAD781" "AG36" ic2(98)
PIN "PAD660" "AV28" ic2(31)	PIN "PAD727" "AR38" ic2(65)	PIN "PAD788" "AF39" ic2(99)
PIN "PAD667" "AU28" ic2(32)	PIN "PAD725" "AR37" ic2(66)	PIN "PAD796" "AF38" ic2(100)
PIN "PAD661" "AW29" ic2(33)	PIN "PAD721" "AR36" ic2(67)	PIN "PAD795" "AF37" ic2(101)

PIN "PAD789" "AF36" ic2(102)	PIN "PAD809" "AC38" ic2(112)	PIN "PAD841" "AA37" ic2(122)
PIN "PAD797" "AE39" ic2(103)	PIN "PAD825" "AC37" ic2(113)	PIN "PAD835" "AA36" ic2(123)
PIN "PAD790" "AE38" ic2(104)	PIN "PAD819" "AC36" ic2(114)	PIN "PAD833" "Y39" ic2(124)
PIN "PAD803" "AE37" ic2(105)	PIN "PAD817" "AC35" ic2(115)	PIN "PAD828" "Y38" ic2(125)
PIN "PAD798" "AE36" ic2(106)	PIN "PAD818" "AB39" ic2(116)	PIN "PAD840" "W39" ic2(126)
PIN "PAD804" "AD39" ic2(107)	PIN "PAD812" "AB38" ic2(117)	PIN "PAD842" "W38" ic2(127)
PIN "PAD802" "AD38" ic2(108)	PIN "PAD834" "AB37" ic2(118)	PIN "PAD846" "W37" ic2(128)
PIN "PAD811" "AD37" ic2(109)	PIN "PAD832" "AB36" ic2(119)	PIN "PAD848" "W36" ic2(129)
PIN "PAD805" "AD36" ic2(110)	PIN "PAD826" "AA39" ic2(120)	PIN "PAD847" "V39" ic2(130)
PIN "PAD810" "AC39" ic2(111)	PIN "PAD820" "AA38" ic2(121)	PIN "PAD853" "V38" ic2(131)

### A.3.2 Xilinx2 'output' pinner

PIN "PAD45" "A31" output(0)	PIN "PAD953" "D37" output(26)	PIN "PAD914" "L36" output(52)
PIN "PAD39" "A32" output(1)	PIN "PAD951" "D38" output(27)	PIN "PAD909" "L37" output(53)
PIN "PAD31" "A33" output(2)	PIN "PAD946" "D39" output(28)	PIN "PAD901" "L38" output(54)
PIN "PAD23" "A34" output(3)	PIN "PAD954" "E37" output(29)	PIN "PAD894" "L39" output(55)
PIN "PAD16" "A35" output(4)	PIN "PAD944" "E38" output(30)	PIN "PAD907" "M37" output(56)
PIN "PAD8" "A36" output(5)	PIN "PAD939" "E39" output(31)	PIN "PAD892" "M38" output(57)
PIN "PAD38" "B31" output(6)	PIN "PAD952" "F36" output(32)	PIN "PAD886" "M39" output(58)
PIN "PAD37" "B32" output(7)	PIN "PAD948" "F37" output(33)	PIN "PAD902" "N36" output(59)
PIN "PAD25" "B33" output(8)	PIN "PAD937" "F38" output(34)	PIN "PAD900" "N37" output(60)
PIN "PAD18" "B34" output(9)	PIN "PAD932" "F39" output(35)	PIN "PAD884" "N38" output(61)
PIN "PAD10" "B35" output(10)	PIN "PAD945" "G36" output(36)	PIN "PAD883" "N39" output(62)
PIN "PAD5" "B36" output(11)	PIN "PAD943" "G37" output(37)	PIN "PAD899" "P36" output(63)
PIN "PAD959" "B37" output(12)	PIN "PAD930" "G38" output(38)	PIN "PAD893" "P37" output(64)
PIN "PAD870" "U36" output(13)	PIN "PAD929" "G39" output(39)	PIN "PAD878" "P38" output(65)
PIN "PAD32" "C31" output(14)	PIN "PAD938" "H36" output(40)	PIN "PAD876" "P39" output(66)
PIN "PAD29" "C32" output(15)	PIN "PAD936" "H37" output(41)	PIN "PAD891" "R36" output(67)
PIN "PAD22" "C33" output(16)	PIN "PAD923" "H38" output(42)	PIN "PAD885" "R37" output(68)
PIN "PAD15" "C34" output(17)	PIN "PAD921" "H39" output(43)	PIN "PAD871" "R38" output(69)
PIN "PAD7" "C35" output(18)	PIN "PAD931" "J36" output(44)	PIN "PAD864" "R39" output(70)
PIN "PAD956" "C38" output(19)	PIN "PAD924" "J37" output(45)	PIN "PAD879" "T36" output(71)
PIN "PAD40" "D30" output(20)	PIN "PAD915" "J38" output(46)	PIN "PAD877" "T37" output(72)
PIN "PAD30" "D31" output(21)	PIN "PAD913" "J39" output(47)	PIN "PAD862" "T38" output(73)
PIN "PAD24" "D32" output(22)	PIN "PAD922" "K36" output(48)	PIN "PAD856" "T39" output(74)
PIN "PAD17" "D33" output(23)	PIN "PAD916" "K37" output(49)	PIN "PAD872" "U35" output(75)
PIN "PAD9" "D34" output(24)	PIN "PAD908" "K38" output(50)	
PIN "PAD2" "D35" output(25)	PIN "PAD906" "K39" output(51)	

### A.3.3 Xilinx2 minne 1

PIN "PAD253" "D1" memport1(0)	PIN "PAD317" "N1" memport1(32)	PIN "PAD354" "AA4" memport1(64)
PIN "PAD249" "D2" memport1(1)	PIN "PAD316" "N2" memport1(33)	PIN "PAD384" "AB1" memport1(65)
PIN "PAD247" "D3" memport1(2)	PIN "PAD295" "N3" memport1(34)	PIN "PAD359" "AB2" memport1(66)
PIN "PAD258" "E1" memport1(3)	PIN "PAD293" "N4" memport1(35)	PIN "PAD361" "AB3" memport1(67)
PIN "PAD256" "E2" memport1(4)	PIN "PAD324" "P1" memport1(36)	PIN "PAD366" "AB4" memport1(68)
PIN "PAD265" "F1" memport1(5)	PIN "PAD322" "P2" memport1(37)	PIN "PAD368" "AB5" memport1(69)
PIN "PAD263" "F2" memport1(6)	PIN "PAD329" "R2" memport1(38)	PIN "PAD390" "AC1" memport1(70)
PIN "PAD248" "F3" memport1(7)	PIN "PAD309" "R3" memport1(39)	PIN "PAD373" "AC2" memport1(71)
PIN "PAD245" "F4" memport1(8)	PIN "PAD307" "R4" memport1(40)	PIN "PAD375" "AC3" memport1(72)
PIN "PAD271" "G1" memport1(9)	PIN "PAD340" "T1" memport1(41)	PIN "PAD381" "AC4" memport1(73)
PIN "PAD270" "G2" memport1(10)	PIN "PAD338" "T2" memport1(42)	PIN "PAD383" "AC5" memport1(74)
PIN "PAD255" "G3" memport1(11)	PIN "PAD318" "T3" memport1(43)	PIN "PAD391" "AD1" memport1(75)
PIN "PAD250" "G4" memport1(12)	PIN "PAD315" "T4" memport1(44)	PIN "PAD396" "AD2" memport1(76)
PIN "PAD279" "H1" memport1(13)	PIN "PAD348" "U1" memport1(45)	PIN "PAD392" "AD4" memport1(77)
PIN "PAD277" "H2" memport1(14)	PIN "PAD346" "U2" memport1(46)	PIN "PAD398" "AE1" memport1(78)
PIN "PAD262" "H3" memport1(15)	PIN "PAD330" "U3" memport1(47)	PIN "PAD403" "AE2" memport1(79)
PIN "PAD257" "H4" memport1(16)	PIN "PAD325" "U4" memport1(48)	PIN "PAD397" "AE3" memport1(80)
PIN "PAD287" "J1" memport1(17)	PIN "PAD323" "U5" memport1(49)	PIN "PAD399" "AE4" memport1(81)
PIN "PAD285" "J2" memport1(18)	PIN "PAD355" "V1" memport1(50)	PIN "PAD406" "AF1" memport1(82)
PIN "PAD269" "J3" memport1(19)	PIN "PAD353" "V2" memport1(51)	PIN "PAD412" "AF2" memport1(83)
PIN "PAD264" "J4" memport1(20)	PIN "PAD339" "V3" memport1(52)	PIN "PAD404" "AF3" memport1(84)
PIN "PAD294" "K1" memport1(21)	PIN "PAD337" "V4" memport1(53)	PIN "PAD405" "AF4" memport1(85)
PIN "PAD292" "K2" memport1(22)	PIN "PAD331" "V5" memport1(54)	PIN "PAD414" "AG1" memport1(86)
PIN "PAD278" "K3" memport1(23)	PIN "PAD367" "W1" memport1(55)	PIN "PAD411" "AG3" memport1(87)
PIN "PAD275" "K4" memport1(24)	PIN "PAD360" "W2" memport1(56)	PIN "PAD413" "AG4" memport1(88)
PIN "PAD302" "L1" memport1(25)	PIN "PAD347" "W3" memport1(57)	PIN "PAD426" "AH2" memport1(89)
PIN "PAD299" "L2" memport1(26)	PIN "PAD345" "W4" memport1(58)	PIN "PAD419" "AH3" memport1(90)
PIN "PAD286" "L3" memport1(27)	PIN "PAD374" "Y1" memport1(59)	PIN "PAD428" "AJ1" memport1(91)
PIN "PAD280" "L4" memport1(28)	PIN "PAD369" "Y2" memport1(60)	PIN "PAD422" "AJ2" memport1(92)
PIN "PAD310" "M1" memport1(29)	PIN "PAD376" "AA1" memport1(61)	PIN "PAD427" "AJ3" memport1(93)
PIN "PAD308" "M2" memport1(30)	PIN "PAD382" "AA2" memport1(62)	PIN "PAD429" "AJ4" memport1(94)
PIN "PAD288" "M3" memport1(31)	PIN "PAD352" "AA3" memport1(63)	

### A.3.4 Xilinx2 minne 2

PIN "PAD234" "A4" memport2(0)	PIN "PAD188" "B11" memport2(32)	PIN "PAD149" "C17" memport2(64)
PIN "PAD226" "A5" memport2(1)	PIN "PAD181" "B12" memport2(33)	PIN "PAD135" "C18" memport2(65)
PIN "PAD219" "A6" memport2(2)	PIN "PAD172" "B13" memport2(34)	PIN "PAD128" "C19" memport2(66)
PIN "PAD212" "A7" memport2(3)	PIN "PAD164" "B14" memport2(35)	PIN "PAD126" "C21" memport2(67)
PIN "PAD209" "A8" memport2(4)	PIN "PAD158" "B15" memport2(36)	PIN "PAD120" "C22" memport2(68)
PIN "PAD201" "A9" memport2(5)	PIN "PAD151" "B16" memport2(37)	PIN "PAD107" "C23" memport2(69)
PIN "PAD193" "A10" memport2(6)	PIN "PAD142" "B17" memport2(38)	PIN "PAD91" "C24" memport2(70)
PIN "PAD186" "A11" memport2(7)	PIN "PAD134" "B18" memport2(39)	PIN "PAD83" "C25" memport2(71)
PIN "PAD174" "A12" memport2(8)	PIN "PAD127" "B19" memport2(40)	PIN "PAD76" "C26" memport2(72)
PIN "PAD166" "A13" memport2(9)	PIN "PAD113" "B20" memport2(41)	PIN "PAD69" "C27" memport2(73)
PIN "PAD163" "A14" memport2(10)	PIN "PAD106" "B21" memport2(42)	PIN "PAD61" "C28" memport2(74)
PIN "PAD156" "A15" memport2(11)	PIN "PAD98" "B22" memport2(43)	PIN "PAD53" "C29" memport2(75)
PIN "PAD144" "A16" memport2(12)	PIN "PAD90" "B23" memport2(44)	PIN "PAD233" "D6" memport2(76)
PIN "PAD136" "A17" memport2(13)	PIN "PAD97" "B24" memport2(45)	PIN "PAD225" "D7" memport2(77)
PIN "PAD129" "A18" memport2(14)	PIN "PAD82" "B25" memport2(46)	PIN "PAD218" "D8" memport2(78)
PIN "PAD121" "A19" memport2(15)	PIN "PAD70" "B26" memport2(47)	PIN "PAD211" "D9" memport2(79)
PIN "PAD108" "A21" memport2(16)	PIN "PAD62" "B27" memport2(48)	PIN "PAD202" "D10" memport2(80)
PIN "PAD100" "A22" memport2(17)	PIN "PAD59" "B28" memport2(49)	PIN "PAD194" "D11" memport2(81)
PIN "PAD92" "A23" memport2(18)	PIN "PAD55" "B29" memport2(50)	PIN "PAD182" "D13" memport2(82)
PIN "PAD89" "A24" memport2(19)	PIN "PAD47" "B30" memport2(51)	PIN "PAD179" "D14" memport2(83)
PIN "PAD84" "A25" memport2(20)	PIN "PAD236" "C5" memport2(52)	PIN "PAD171" "D15" memport2(84)
PIN "PAD77" "A26" memport2(21)	PIN "PAD231" "C6" memport2(53)	PIN "PAD159" "D16" memport2(85)
PIN "PAD68" "A27" memport2(22)	PIN "PAD223" "C7" memport2(54)	PIN "PAD150" "D17" memport2(86)
PIN "PAD60" "A28" memport2(23)	PIN "PAD216" "C8" memport2(55)	PIN "PAD141" "D18" memport2(87)
PIN "PAD54" "A29" memport2(24)	PIN "PAD204" "C9" memport2(56)	PIN "PAD133" "D19" memport2(88)
PIN "PAD52" "A30" memport2(25)	PIN "PAD196" "C10" memport2(57)	PIN "PAD114" "D22" memport2(89)
PIN "PAD232" "B5" memport2(26)	PIN "PAD189" "C11" memport2(58)	PIN "PAD105" "D23" memport2(90)
PIN "PAD224" "B6" memport2(27)	PIN "PAD187" "C12" memport2(59)	PIN "PAD85" "D24" memport2(91)
PIN "PAD217" "B7" memport2(28)	PIN "PAD180" "C13" memport2(60)	PIN "PAD78" "D25" memport2(92)
PIN "PAD210" "B8" memport2(29)	PIN "PAD173" "C14" memport2(61)	PIN "PAD75" "D26" memport2(93)
PIN "PAD203" "B9" memport2(30)	PIN "PAD165" "C15" memport2(62)	PIN "PAD67" "D27" memport2(94)
PIN "PAD195" "B10" memport2(31)	PIN "PAD157" "C16" memport2(63)	

### A.3.5 Xilinx2 localbus

PIN "PAD595" "AV19" localbus(0)	PIN "PAD518" "AT10" localbus(27)	PIN "PAD488" "AV4" localbus(54)
PIN "PAD444" "AL3" localbus(1)	PIN "PAD526" "AT11" localbus(28)	PIN "PAD482" "AV5" localbus(55)
PIN "PAD450" "AL4" localbus(2)	PIN "PAD535" "AT13" localbus(29)	PIN "PAD498" "AV6" localbus(56)
PIN "PAD443" "AM1" localbus(3)	PIN "PAD541" "AT14" localbus(30)	PIN "PAD505" "AV7" localbus(57)
PIN "PAD449" "AM2" localbus(4)	PIN "PAD549" "AT15" localbus(31)	PIN "PAD511" "AV8" localbus(58)
PIN "PAD451" "AM3" localbus(5)	PIN "PAD558" "AT16" localbus(32)	PIN "PAD519" "AV9" localbus(59)
PIN "PAD456" "AM4" localbus(6)	PIN "PAD570" "AT17" localbus(33)	PIN "PAD527" "AV10" localbus(60)
PIN "PAD452" "AN1" localbus(7)	PIN "PAD579" "AT18" localbus(34)	PIN "PAD534" "AV11" localbus(61)
PIN "PAD458" "AN2" localbus(8)	PIN "PAD587" "AT19" localbus(35)	PIN "PAD542" "AV12" localbus(62)
PIN "PAD463" "AN3" localbus(9)	PIN "PAD600" "AT21" localbus(36)	PIN "PAD550" "AV13" localbus(63)
PIN "PAD465" "AN4" localbus(10)	PIN "PAD481" "AU4" localbus(37)	PIN "PAD557" "AV14" localbus(64)
PIN "PAD457" "AP1" localbus(11)	PIN "PAD489" "AU6" localbus(38)	PIN "PAD564" "AV15" localbus(65)
PIN "PAD459" "AP2" localbus(12)	PIN "PAD497" "AU7" localbus(39)	PIN "PAD572" "AV16" localbus(66)
PIN "PAD468" "AP3" localbus(13)	PIN "PAD504" "AU8" localbus(40)	PIN "PAD580" "AV17" localbus(67)
PIN "PAD472" "AP4" localbus(14)	PIN "PAD512" "AU9" localbus(41)	PIN "PAD588" "AV18" localbus(68)
PIN "PAD464" "AR1" localbus(15)	PIN "PAD520" "AU10" localbus(42)	PIN "PAD490" "AW4" localbus(69)
PIN "PAD471" "AR2" localbus(16)	PIN "PAD528" "AU11" localbus(43)	PIN "PAD496" "AW5" localbus(70)
PIN "PAD474" "AR3" localbus(17)	PIN "PAD533" "AU12" localbus(44)	PIN "PAD503" "AW6" localbus(71)
PIN "PAD466" "AT1" localbus(18)	PIN "PAD540" "AU13" localbus(45)	PIN "PAD510" "AW7" localbus(72)
PIN "PAD473" "AT2" localbus(19)	PIN "PAD547" "AU14" localbus(46)	PIN "PAD525" "AW9" localbus(74)
PIN "PAD476" "AT3" localbus(20)	PIN "PAD555" "AU15" localbus(47)	PIN "PAD539" "AW11" localbus(76)
PIN "PAD565" "AR17" localbus(21)	PIN "PAD563" "AU16" localbus(48)	PIN "PAD532" "AW10" localbus(77)
PIN "PAD577" "AR18" localbus(22)	PIN "PAD571" "AU17" localbus(49)	PIN "PAD556" "AW13" localbus(78)
PIN "PAD487" "AT6" localbus(23)	PIN "PAD585" "AU18" localbus(50)	PIN "PAD562" "AW14" localbus(79)
PIN "PAD495" "AT7" localbus(24)	PIN "PAD592" "AU19" localbus(51)	PIN "PAD569" "AW15" localbus(80)
PIN "PAD502" "AT8" localbus(25)	PIN "PAD594" "AU21" localbus(52)	PIN "PAD578" "AW16" localbus(81)
PIN "PAD509" "AT9" localbus(26)	PIN "PAD485" "AV3" localbus(53)	

### A.3.6 Xilinx2 klokkepinner

PIN "GCK0" "AW19" clk\_bus(2)  
 PIN "GCK1" "AU22" clk\_bus(5)  
 PIN "GCK2" "D21" memclk\_fb2  
 PIN "GCK3" "A20" clk\_bus(11)  
 PIN "PAD854" "U38" memclk\_out2

### A.3.7 Xilinx2 testpinner

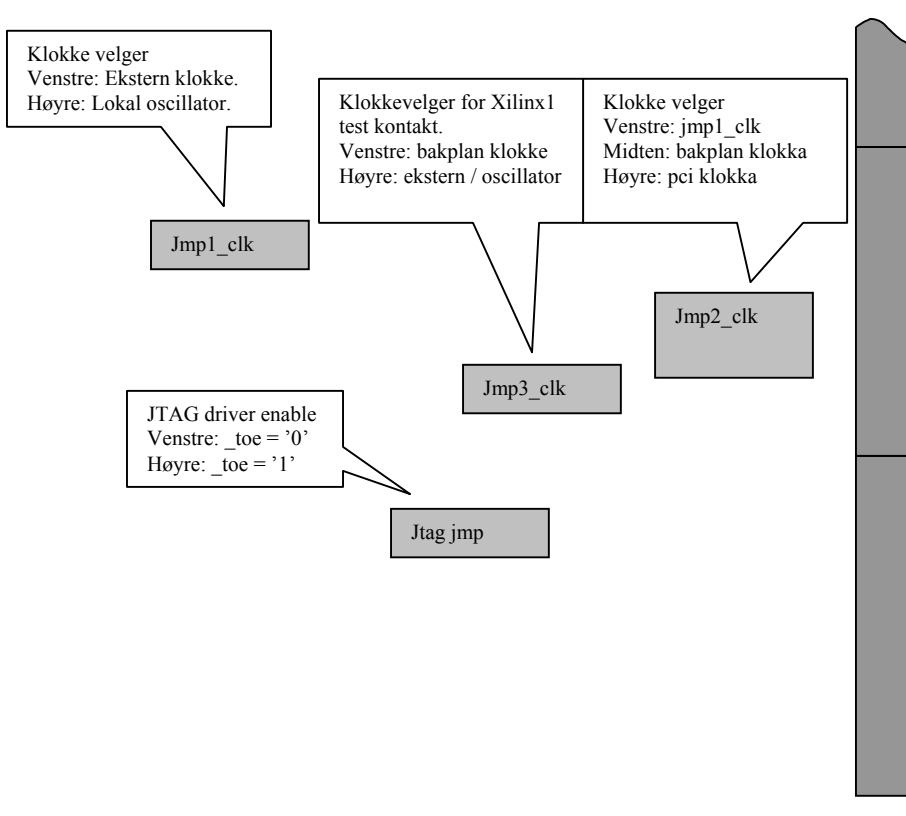
PIN "PAD517" "AW8" tp200	PIN "D4" "AD3" tp205	PIN "CS" "D5" tp210
PIN "PAD548" "AW12" tp201	PIN "D5" "AG2" tp206	PIN "PAD46" "C30" tp211
PIN "D1" "P4" tp202	PIN "D6" "AH1" tp207	PIN "PAD99" "E23" tp212
PIN "D2" "P3" tp203	PIN "D7" "AR4" tp208	PIN "PAD112" "E22" tp213
PIN "D3" "R1" tp204	PIN "WRITE" "B4" tp209	PIN "PAD434" "AK3" tp215

PIN "PAD143" "E18" tp214	PIN "PAD861" "V36" tp221	PIN "PAD48" "D29" tp227
PIN "PAD436" "AK4" tp216	PIN "PAD827" "AB35" tp222	PIN "PAD152" "E17" tp228
PIN "PAD441" "AL1" tp217	PIN "PAD593" "AW18" tp223	PIN "PAD433" "AK1" tp229
PIN "PAD442" "AL2" tp218	PIN "PAD586" "AW17" tp224	PIN "PAD435" "AK2" tp230
PIN "PAD869" "U37" tp219	PIN "BUSY_DOUT" "E3" tp225	
PIN "PAD863" "V35" tp220	PIN "PAD849" "U39" tp226	

### A.3.8 Xilinx2 prom, jtag, mode og temperaturdioder

Kobling til init prom og JTAG	PIN "TDI" "B3" tdoxilinx#2	PIN "M1" "AU38" m1 (gnd)
	PIN "CCLK" "E4" cclk3	PIN "M2" "AT35" m2 (gnd)
PIN "ERR_INIT" "AU2" init3#	PIN "PROGRAM" "AT5" program#	
PIN "DONE" "AU5" done3		
PIN "TDO" "C4" tdo		Kobling til temperaturdioden
PIN "D0_DIN" "C2" din3	Intern 'mode' setting	
PIN "TCK" "C36" jtag(0)		PIN temp_anode AU35 temp_pos2
PIN "TMS" "E36" jtag(1)	PIN "M0" "AT37" m0 (gnd)	pin temp_katode AV37 temp_neg2

## B KLOKKE KONFIGURERING JUMPER PLASSERING





**C PLD LIGNINGER**

```

module fpga2dec
title 'fpga2 decoder'
repdec device 'P22V10';

iclkin,inputclk,iclkout          pin 1,2,23;
_cs,a15,a14,a13,a12,a11         pin 3,4,5,6,7,8;
_ads,w_r,_reset                 pin 9,10,11;
_jtag_strobe                    pin 15;
strbdly0                        pin 16;
strbdly1                        pin 17;
_program,_id_oe,r_w,           pin 18,19,22;

X,Z,H,L = .x.,.z.,1,0;

a = [a15,a14,a13,a12,a11,0,0,0];

equations

!_program = (!_ads & !_cs & (a == ^h20))
           # (!_program & (!_ads & !_cs & (a == ^h28)));

strbdly0 := !_ads & !_cs & (a == ^h00) & !w_r;

!_jtag_strobe := !_ads & !_cs & (a == ^h00)
              # strbdly0;

r_w = !w_r;

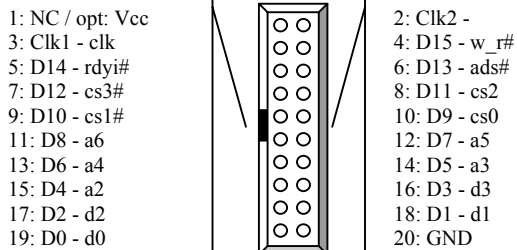
!_id_oe = (a == ^h08) & (_cs == 0) & (w_r == 0);

end;

```

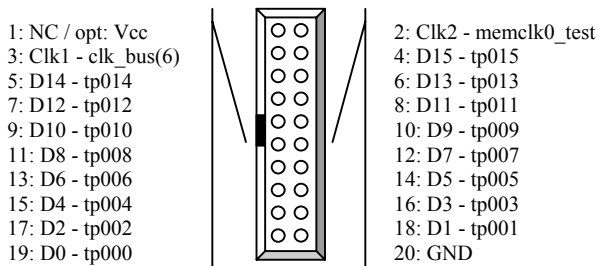
## D FRONT KONTAKT DEFINISJONER

### D.1 Local\_bus testkontakt (t1\_local eller U4)

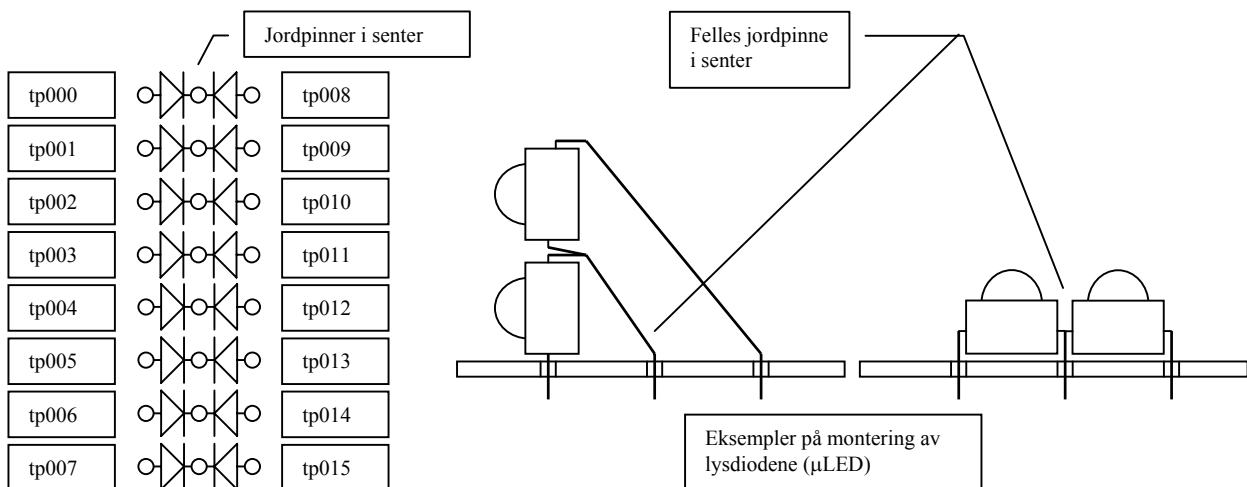


### D.2 FPGA0 testkontakter og lysdioder

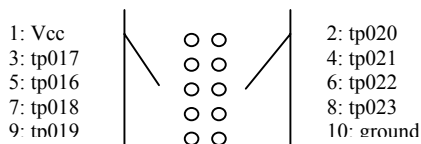
#### D.2.1 Frontkontakt (tpc1\_x0 eller U7)



#### D.2.2 Dioderekke (LEDt000 – LEDt007)

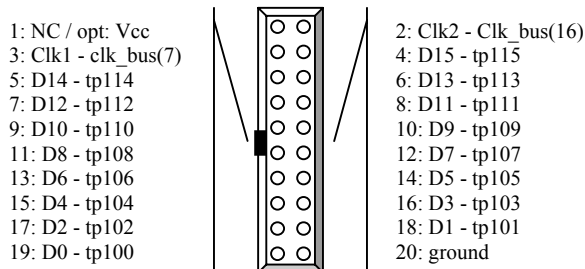


#### D.2.3 Testpinner (tpc2\_x0)

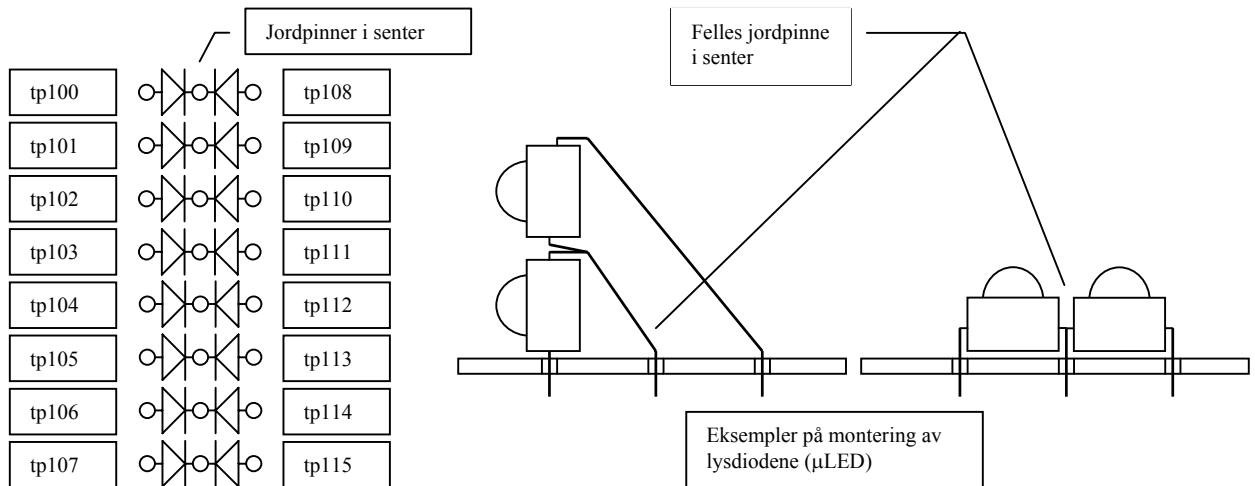


### D.3 FPGA1 testkontakter og lysdioder

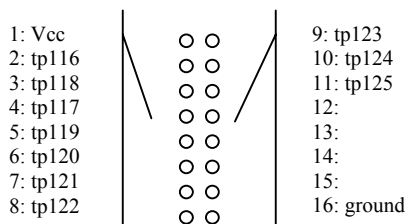
#### D.3.1 Frontkontakt (tpc1\_x1 eller U6)



#### D.3.2 Dioderekke (LEDt100 – LEDt107)

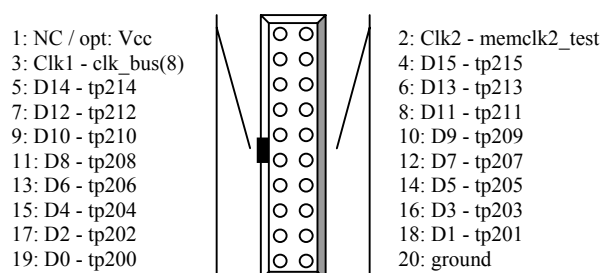


#### D.3.3 Testpinner (tpc2\_x1)

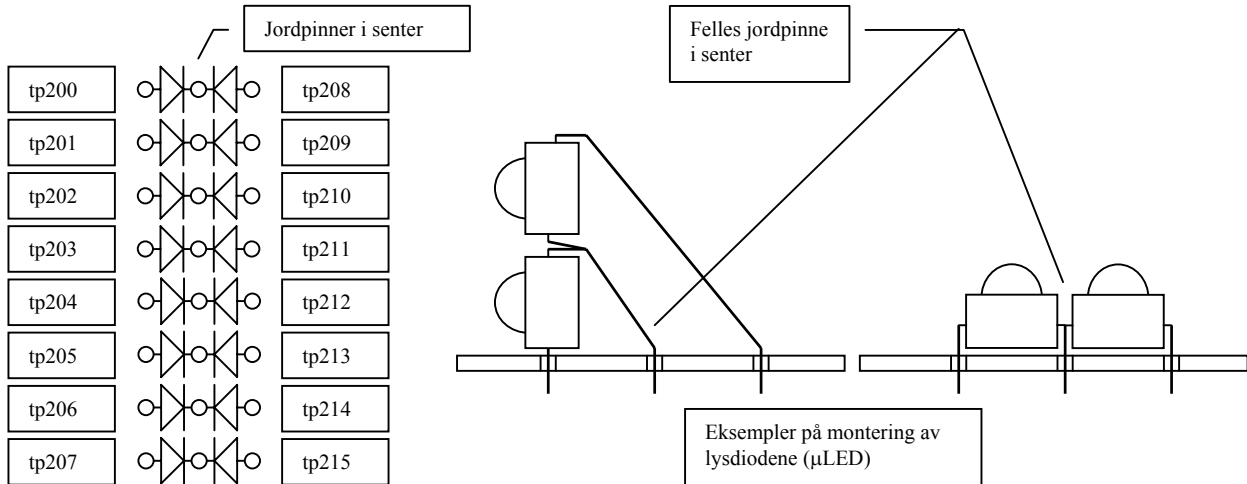


### D.4 FPGA2 testkontakter og lysdioder

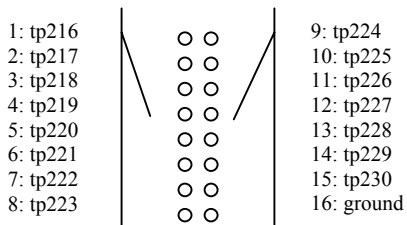
#### D.4.1 Frontkontakt (tpc1\_x2 eller U5)



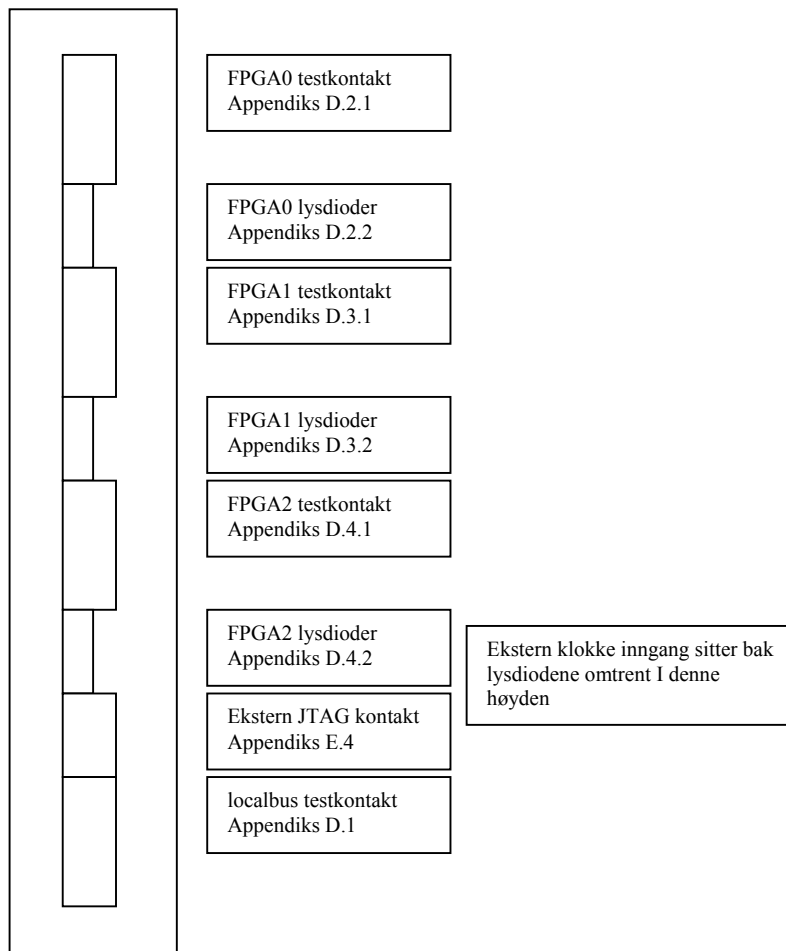
### D.4.2 Dioderekke (LEDt200 – LEDt207)



### D.4.3 Testpinner (tpc2\_x2)

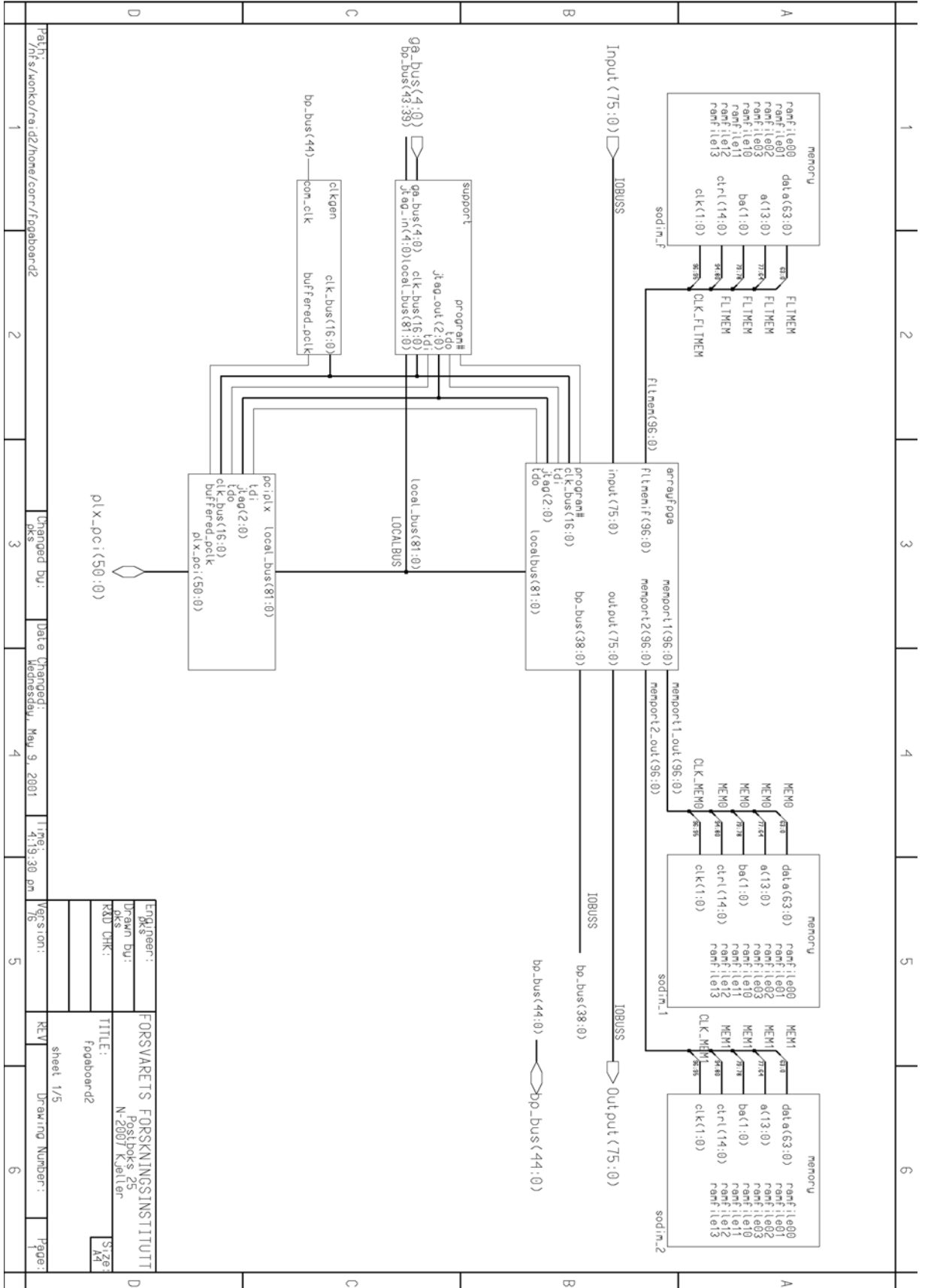


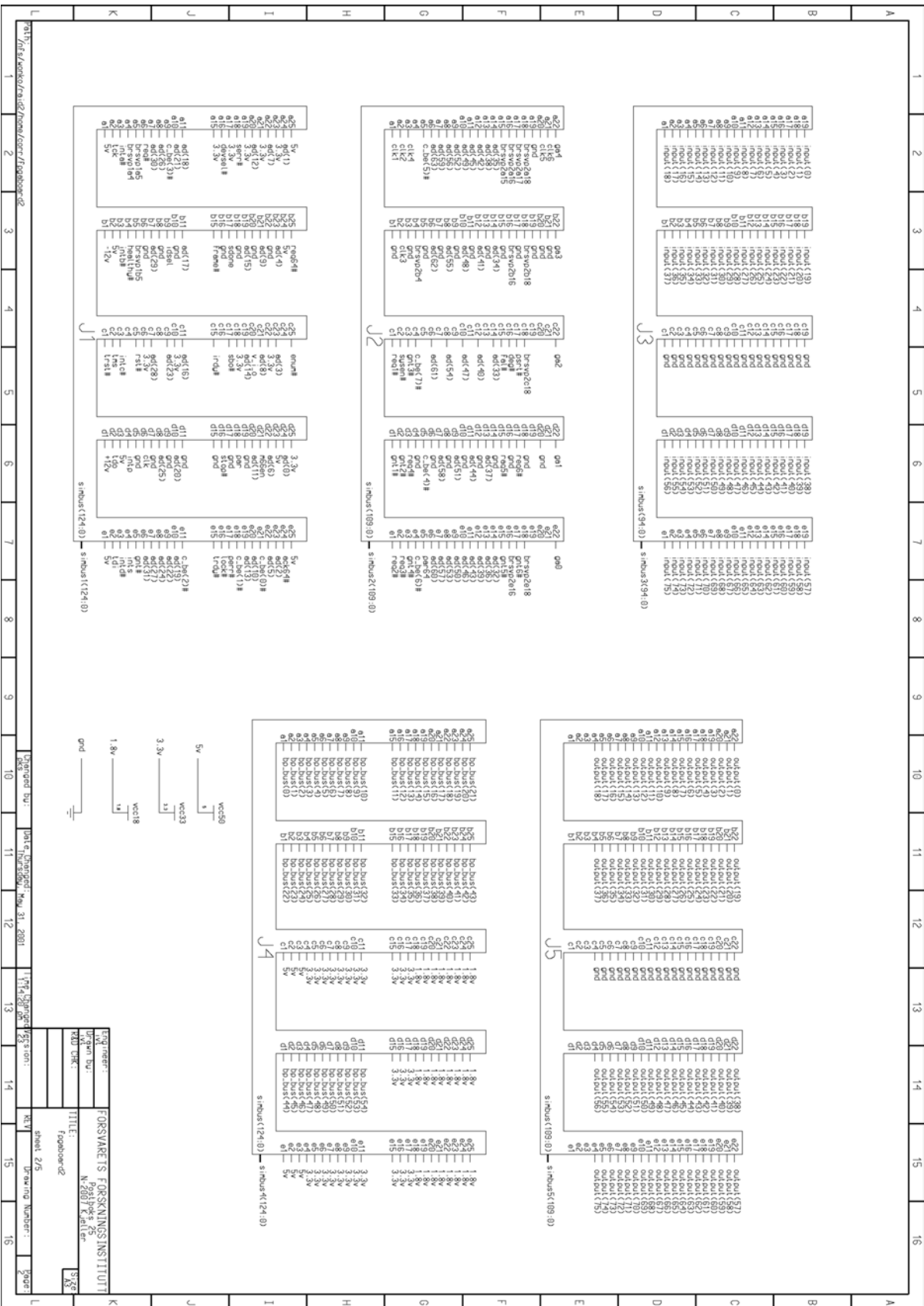
## D.5 Frontpanel

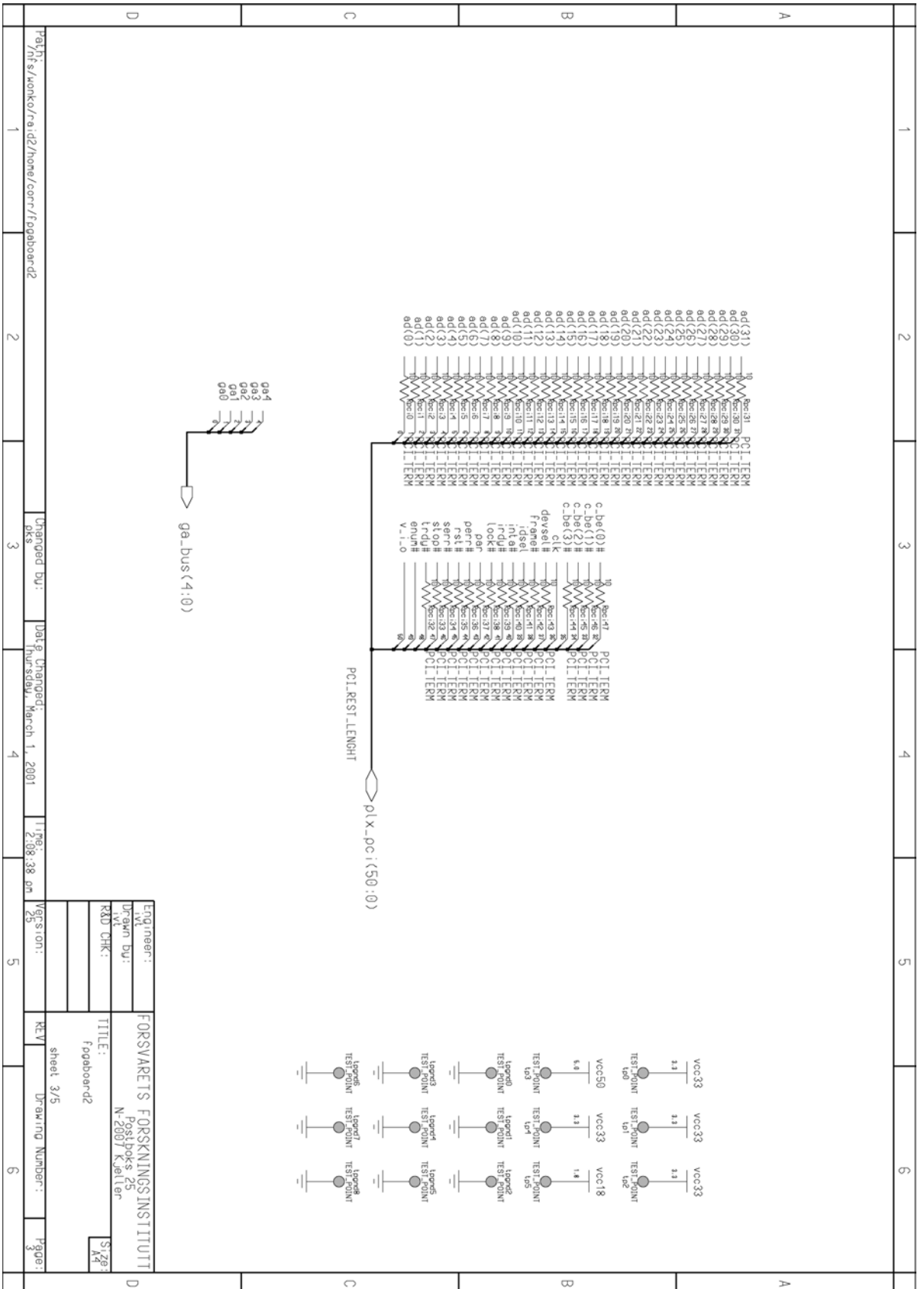


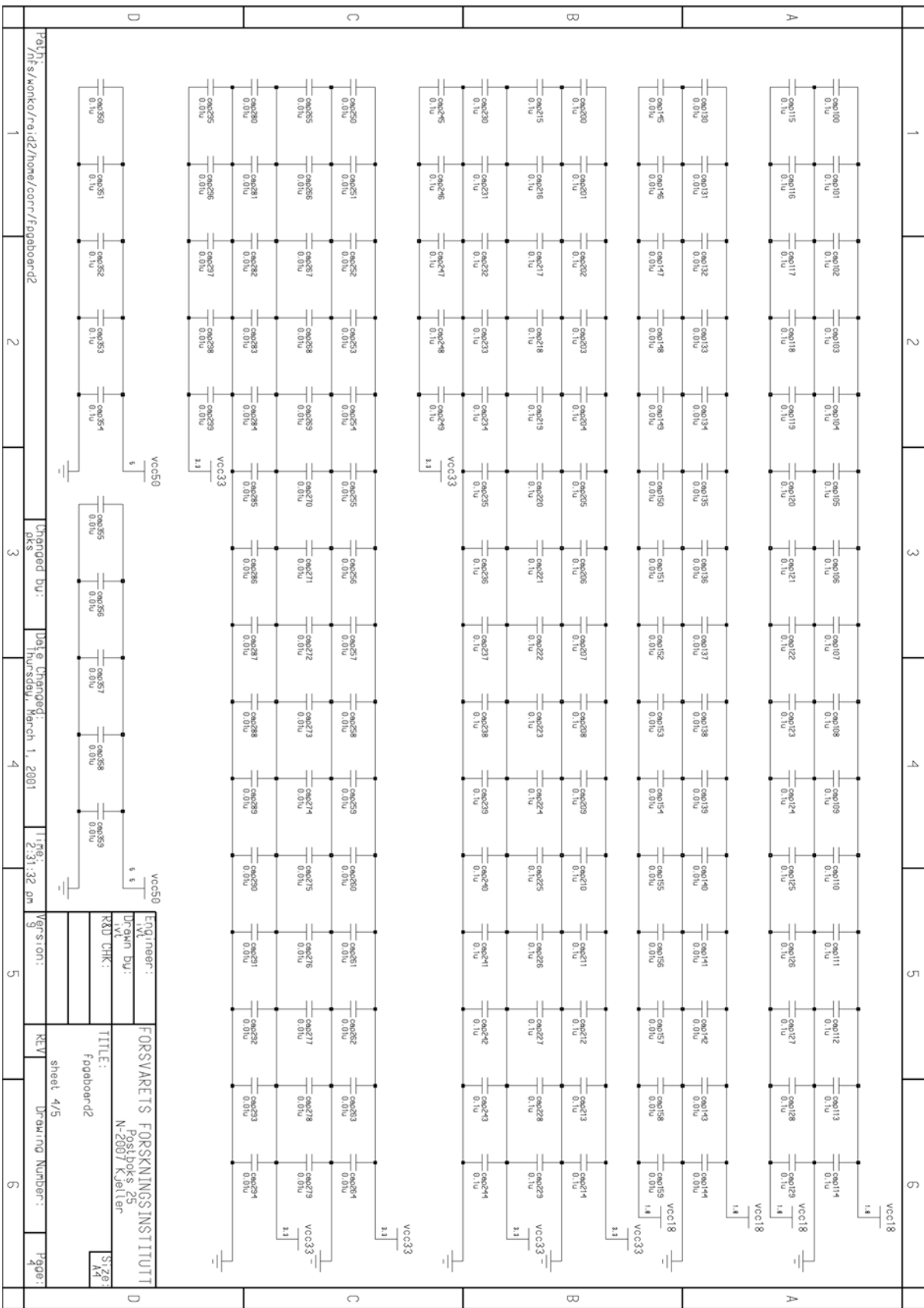
# E SKEMAER

## E.1 FPGAbord2 toppnivå





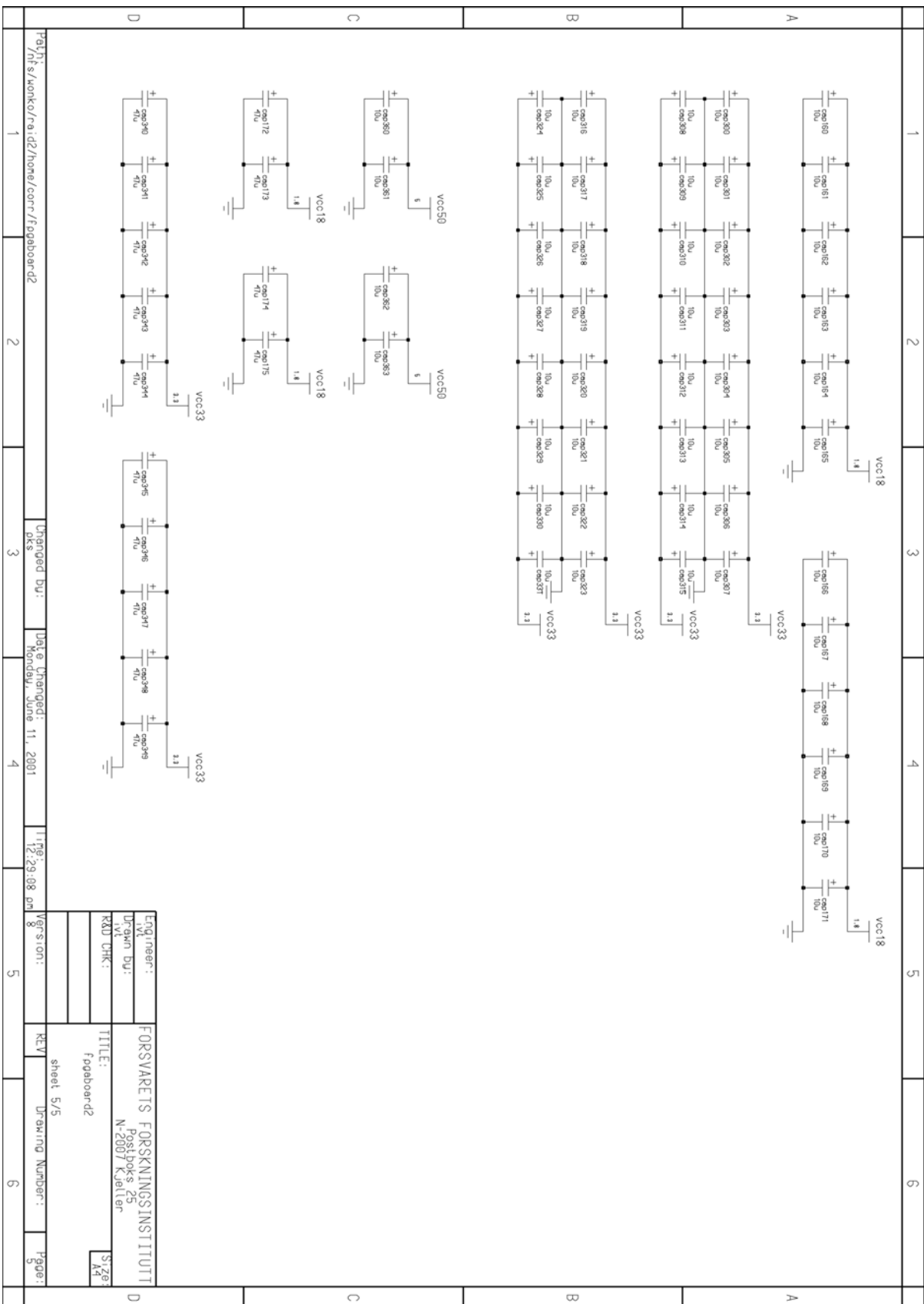




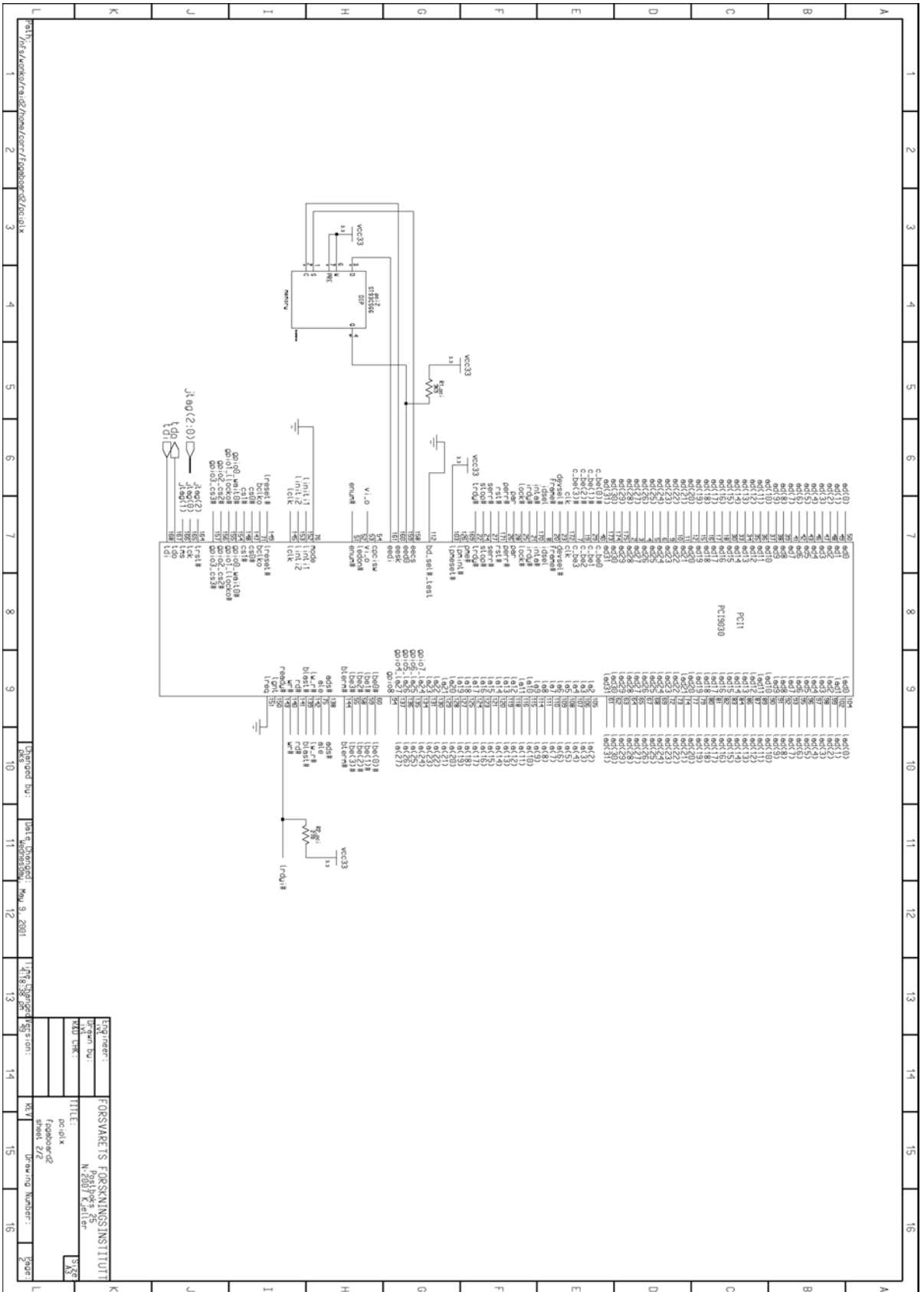
File: /rfs/konko/raidz/home/corr/fpgaboard2  
 1 2 3 4 5 6  
 Changed by: Date Changed: Time: Version: REV Drawing Number: Page:  
 pcs hrs:mins March 1, 2001 2:31:32 am 9 sheet 4/5  
 4

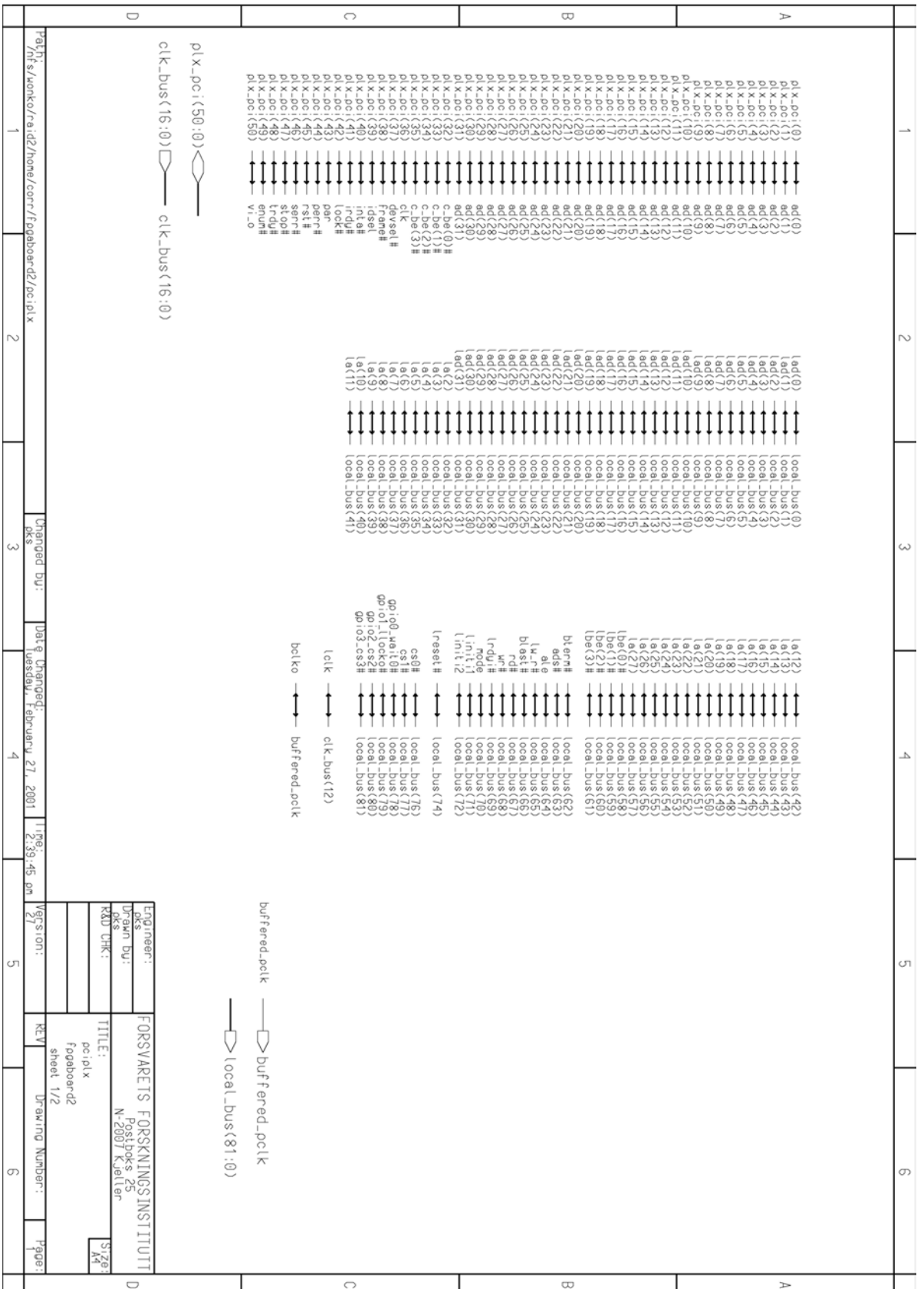
ENGINEER: FORSVARETS FORSKNINGSinSTITUTT  
 Drawn by: Postboks 25  
 RxD CHK: N-2007 Kjeller  
 TITLE: fpgaboard2  
 S:Ze  
 4/4



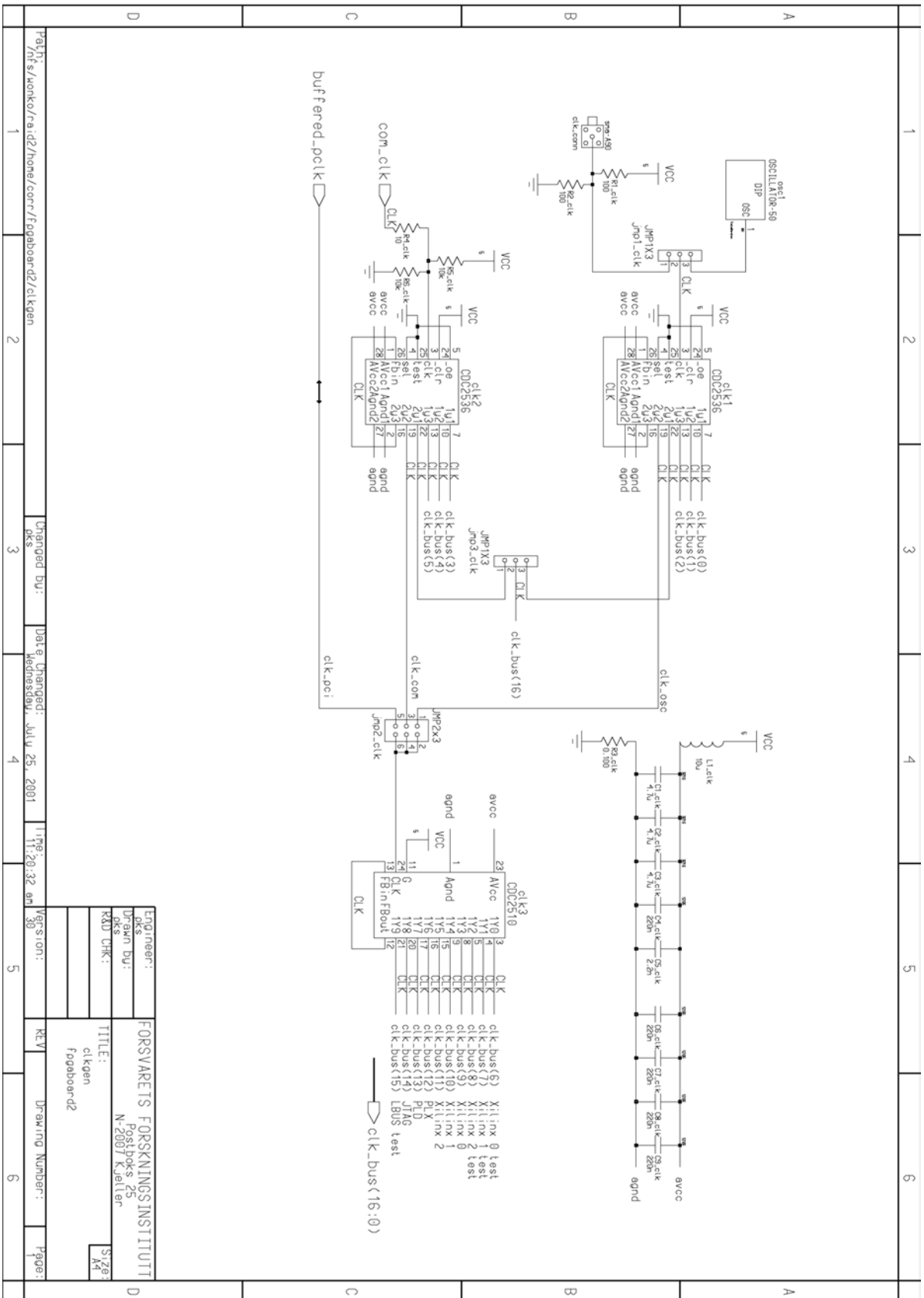


E.2 PCI\_plx



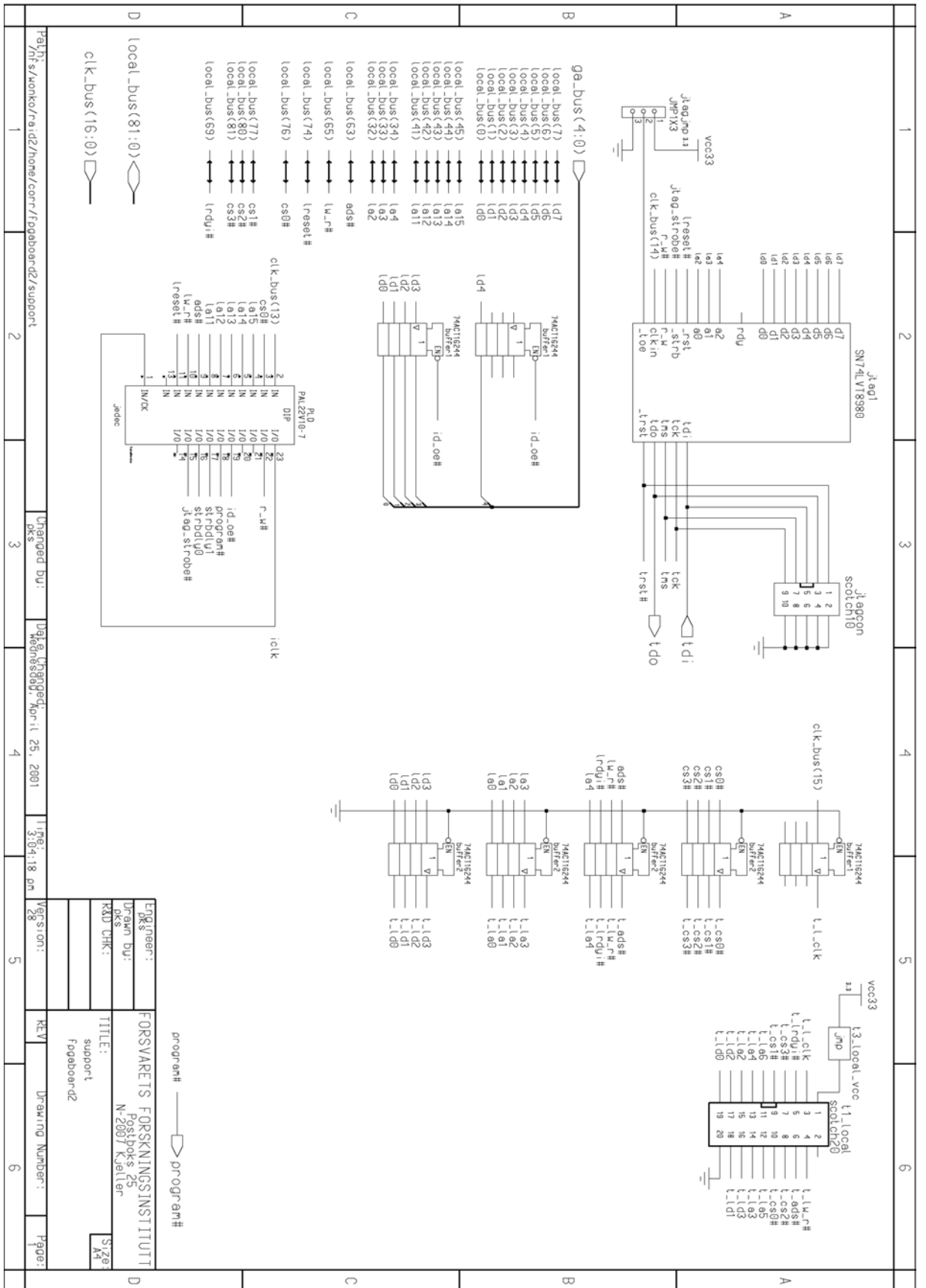


E.3 Clk\_gen

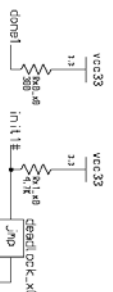
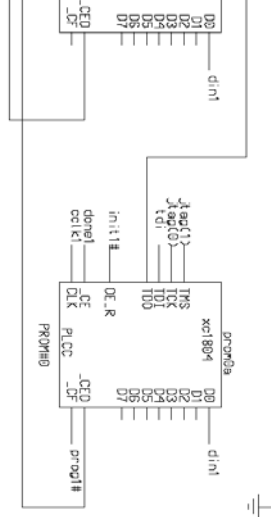
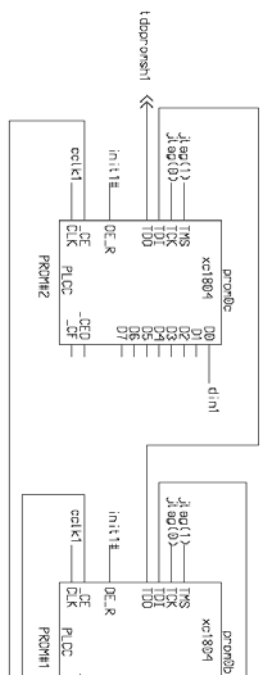
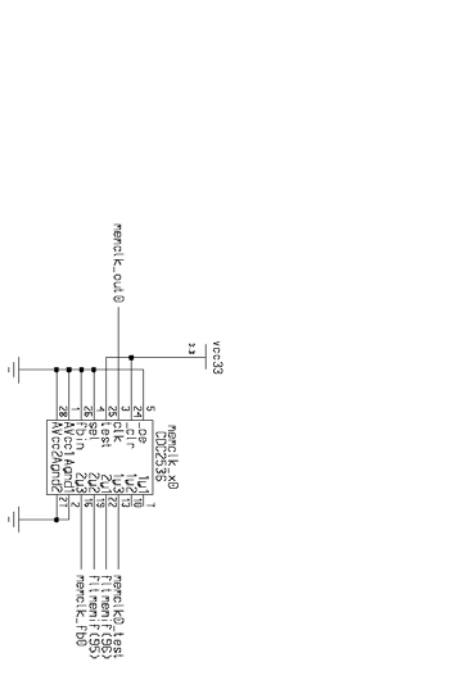


1	2	3	4	5	6
Title: /Nt/s/wonko/r/aid2/home/corr/fpogboar-d2/clkgen		Changed by: oks	Date Changed: 25. juli 2001	Time: 11:26:32 am	Version: 30
Engineer: oks		FORSVARETS FORSKNINGSinSTITUTT			
Drawn by: oks		Postboks 25 N-2007 Kjeller			
R&D CHK: oks		TITLE: clkgen			
Date: 25. juli 2001		fopogboar-d2			
Drawing Number:		Page: 3/28			

E.4 Support



# E.5 Array\_fpga



10 11 12 13 14 15 16

clk\_bus(16:0) <--- clk\_bus(16:0)

clk\_bus(16:0) <--- clk\_bus(16:0)

ldi <--- ldi

program# <--- program#

jq(2:0) <--- jq(2:0)

jq(2:0) <--- jq(2:0)

localbus(81:0) <--- localbus(81:0)

localbus(81:0) <--- localbus(81:0)

input(75:0) <--- input(75:0)

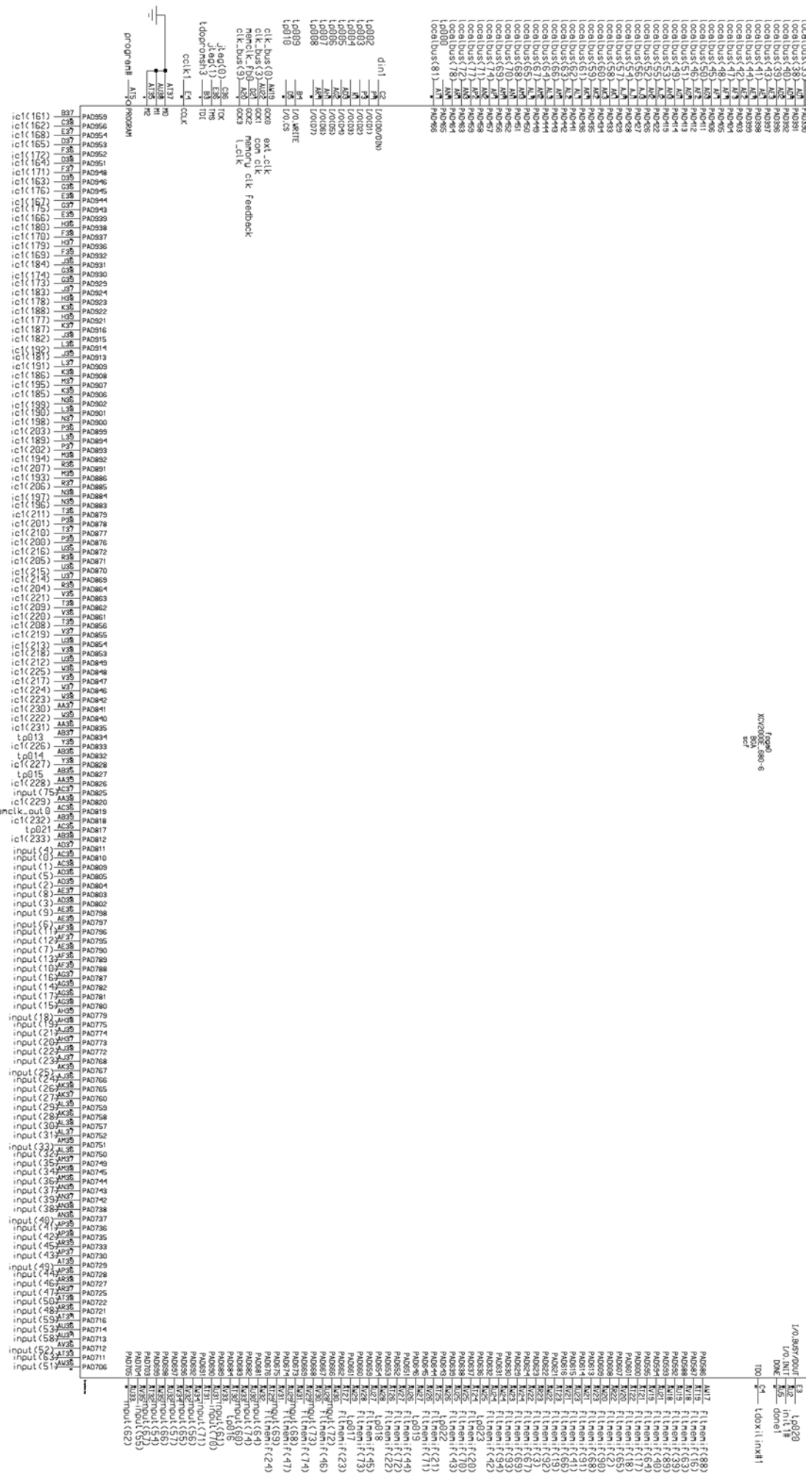
flmemif(96:0) <--- flmemif(96:0)

ic(233:0) <--- ic(233:0)

tdopromsh33 <--- tdopromsh33

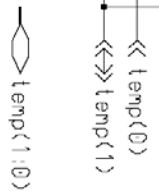
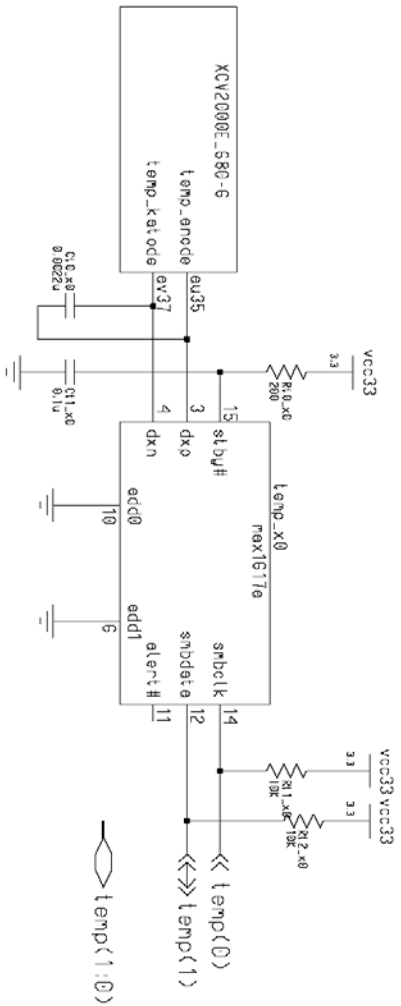
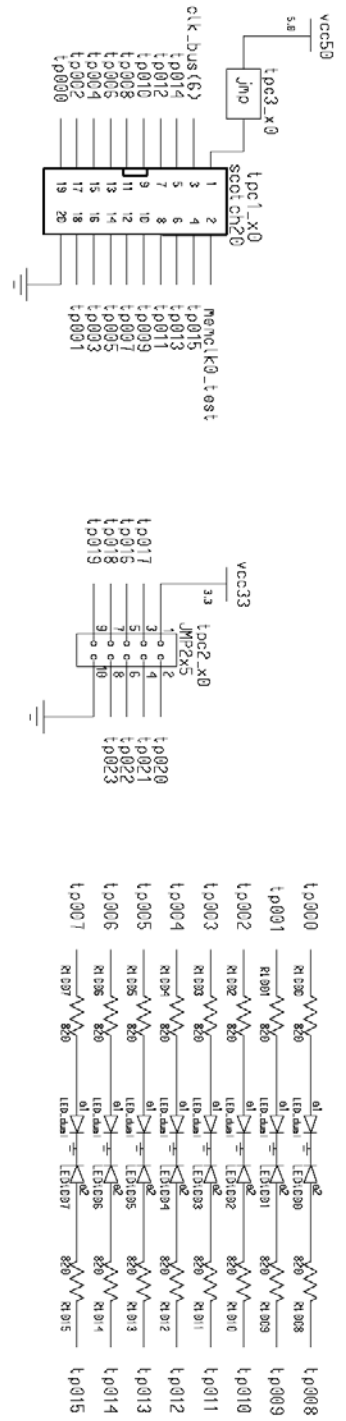
ldox11nrxh1 <--- ldox11nrxh1

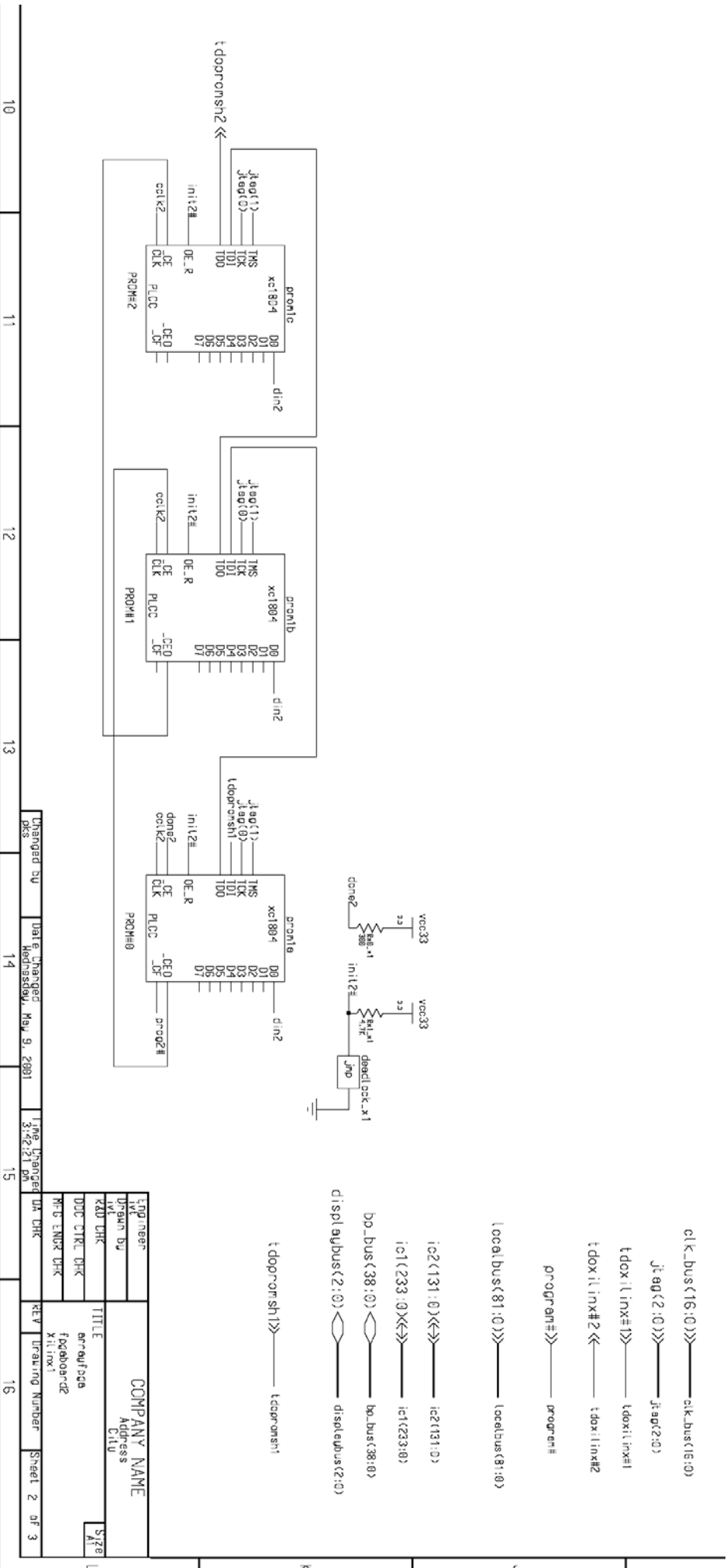
COMPANY NAME	Address	City
arranupage	XXXXXX	XXXXXX
fapoonanz	XXXXXX	XXXXXX
kdub ENDK DNR	XXXXXX	XXXXXX
KEY	XXXXXX	XXXXXX
KEY	XXXXXX	XXXXXX
KEY	XXXXXX	XXXXXX
KEY	XXXXXX	XXXXXX



ic1 (19)	PA2034	F2	ic1 (22)
ic1 (20)	PA2035	F3	ic1 (23)
ic1 (21)	PA2036	F4	ic1 (24)
ic1 (22)	PA2037	F2	ic1 (25)
ic1 (23)	PA2038	F3	ic1 (26)
ic1 (24)	PA2039	F4	ic1 (27)
ic1 (25)	PA2040	F2	ic1 (28)
ic1 (26)	PA2041	F3	ic1 (29)
ic1 (27)	PA2042	F4	ic1 (30)
ic1 (28)	PA2043	F2	ic1 (31)
ic1 (29)	PA2044	F3	ic1 (32)
ic1 (30)	PA2045	F4	ic1 (33)
ic1 (31)	PA2046	F2	ic1 (34)
ic1 (32)	PA2047	F3	ic1 (35)
ic1 (33)	PA2048	F4	ic1 (36)
ic1 (34)	PA2049	F2	ic1 (37)
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ic1 (38)	PA2053	F3	ic1 (41)
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ic1 (55)	PA2070	F2	ic1 (58)
ic1 (56)	PA2071	F3	ic1 (59)
ic1 (57)	PA2072	F4	ic1 (60)
ic1 (58)	PA2073	F2	ic1 (61)
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ic1 (64)	PA2079	F2	ic1 (67)
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ic1 (66)	PA2081	F4	ic1 (69)
ic1 (67)	PA2082	F2	ic1 (70)
ic1 (68)	PA2083	F3	ic1 (71)
ic1 (69)	PA2084	F4	ic1 (72)
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ic1 (72)	PA2087	F4	ic1 (75)
ic1 (73)	PA2088	F2	ic1 (76)
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ic1 (82)	PA2097	F2	ic1 (85)
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	PA2118	F2	ic1 (106)
	PA2119	F3	ic1 (107)
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	PA2318	F4	ic1 (306)
	PA2319	F2	ic1 (307)
	PA2320	F3	ic1 (308)
	PA2321	F4	ic1 (309)
	PA2322	F2	ic1 (310)
	PA2323	F3	ic1 (311)
	PA2324	F4	ic1 (312)
	PA2325	F2	ic1 (313)
	PA2326	F3	ic1 (314)
	PA2327	F4	ic1 (315)
	PA2328	F2	ic1 (316)
	PA2329	F3	ic1 (317)
	PA2330	F4	ic1 (318)
	PA2331	F2	ic1 (319)
	PA2332	F3	ic1 (320)
	PA2333	F4	ic1 (321)
	PA2334	F2	ic1 (322)
	PA2335	F3	ic1 (323)
	PA2336	F4	ic1 (324)
	PA2337	F2	ic1 (325)
	PA2338	F3	ic1 (326)
	PA2339	F4	ic1 (327)
	PA2340	F2	ic1 (328)
	PA2341	F3	ic1 (329)
	PA2342	F4	ic1 (330)
	PA2343	F2	ic1 (331)
	PA2344	F3	ic1 (332)
	PA2345	F4	ic1 (333)
	PA2346	F2	ic1 (334)
	PA2347	F3	ic1 (335)
	PA2348	F4	ic1 (336)
	PA2349	F2	ic1 (337)
	PA2350	F3	ic1 (338)
	PA2351	F4	ic1 (339)
	PA2352	F2	ic1 (340)
	PA2353	F3	ic1 (341)
	PA2354	F4	ic1 (342)
	PA2355	F2	ic1 (343)
	PA2356	F3	ic1 (344)
	PA2357	F4	ic1 (345)
	PA2358	F2	ic1 (346)
	PA2359	F3	ic1 (347)
	PA2360	F4	ic1 (348)
	PA2361	F2	ic1 (349)
	PA2362	F3	ic1 (350)
	PA2363	F4	ic1 (351)
	PA236		







clk\_bus(16:0) <<> clk\_bus(16:0)

jeq(2:0) <<> jeq(2:0)

tdox1[lnx#1] <<> tdox1[lnx#1]

tdox2[lnx#2] <<> tdox2[lnx#2]

program# <<> program#

localbus(81:0) <<> localbus(81:0)

ic2(131:0) <<> ic2(131:0)

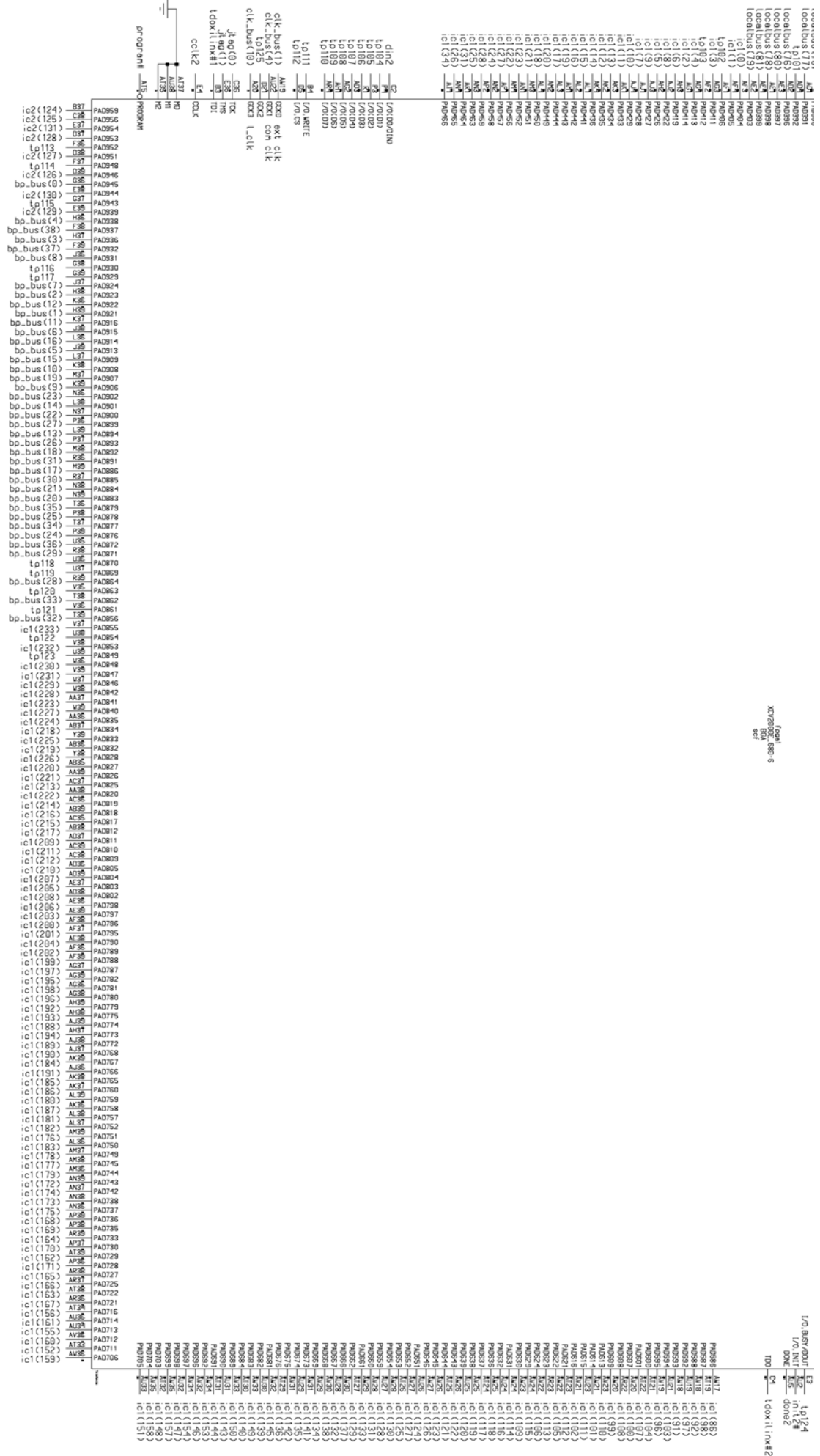
ic1(233:0) <<> ic1(233:0)

bp\_bus(38:0) <<> bp\_bus(38:0)

displaybus(2:0) <<> displaybus(2:0)

t\_dopromsh1 <<> t\_dopromsh1

Engineer	COMPANY NAME
Design bu	Address
R&D CHK	CITY
DOC CTRL CHK	TITLE
PRO ENGR CHK	Project/Order
DA CHK	File/Inx#
	Drawing Number
	Sheet 2 of 3
	Size A1



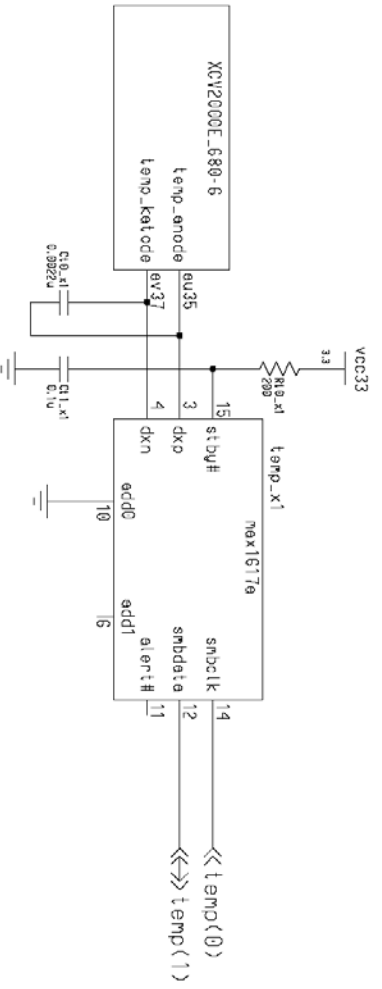
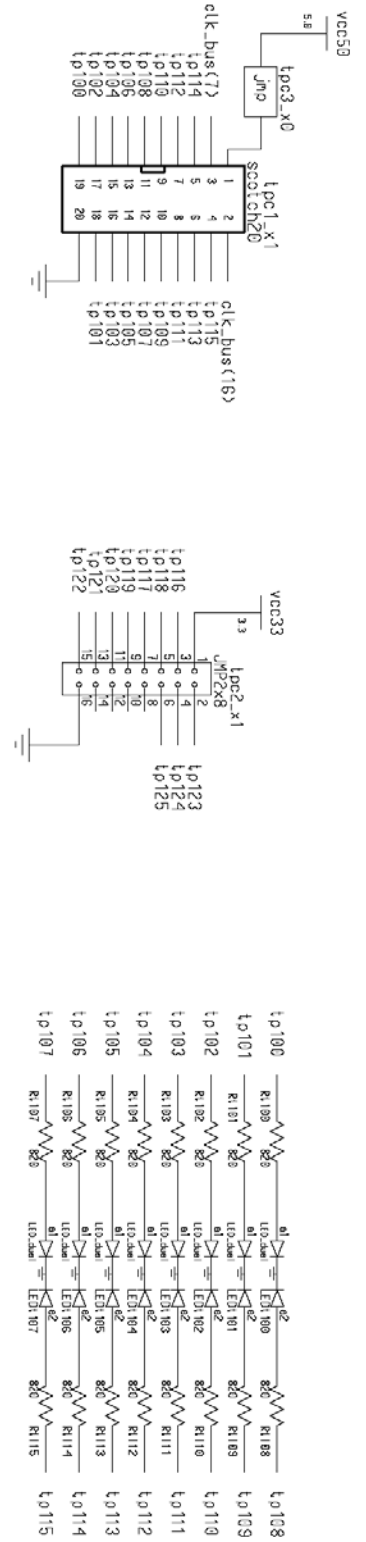
local bus (20)	PA0264	F2	local bus (3)
local bus (5)	PA0265	F1	local bus (15)
local bus (19)	PA0266	F4	local bus (3)
local bus (3)	PA0267	E2	local bus (9)
local bus (24)	PA0268	E2	local bus (4)
local bus (14)	PA0269	E2	local bus (11)
local bus (23)	PA0270	E4	local bus (0)
local bus (28)	PA0271	D2	local bus (12)
local bus (18)	PA0272	D2	local bus (1)
local bus (17)	PA0273	F3	local bus (7)
local bus (31)	PA0274	F4	local bus (2)
local bus (22)	PA0275	C5	local bus (8)
local bus (21)	PA0276	K4	ic2 (0)
local bus (25)	PA0277	C5	ic2 (7)
local bus (26)	PA0278	C5	ic2 (2)
local bus (23)	PA0279	C5	ic2 (6)
local bus (25)	PA0280	K5	ic2 (11)
local bus (26)	PA0281	D7	ic2 (11)
local bus (24)	PA0282	D7	ic2 (5)
local bus (29)	PA0283	C7	ic2 (10)
local bus (23)	PA0284	A5	ic2 (4)
local bus (24)	PA0285	D8	ic2 (15)
local bus (23)	PA0286	B7	ic2 (9)
local bus (23)	PA0287	C9	ic2 (14)
local bus (24)	PA0288	K7	ic2 (8)
local bus (23)	PA0289	D9	ic2 (19)
local bus (23)	PA0290	B9	ic2 (12)
local bus (23)	PA0291	C9	ic2 (18)
local bus (23)	PA0292	B9	ic2 (17)
local bus (23)	PA0293	D10	ic2 (23)
local bus (23)	PA0294	C10	ic2 (16)
local bus (23)	PA0295	B10	ic2 (21)
local bus (23)	PA0296	B10	ic2 (22)
local bus (23)	PA0297	D11	ic2 (27)
local bus (23)	PA0298	C11	ic2 (20)
local bus (23)	PA0299	B11	ic2 (26)
local bus (23)	PA0300	C12	ic2 (25)
local bus (23)	PA0301	C12	ic2 (30)
local bus (23)	PA0302	A11	ic2 (24)
local bus (23)	PA0303	B12	ic2 (34)
local bus (23)	PA0304	B12	ic2 (29)
local bus (23)	PA0305	C13	ic2 (33)
local bus (23)	PA0306	D14	ic2 (38)
local bus (23)	PA0307	D14	ic2 (38)
local bus (23)	PA0308	C14	ic2 (28)
local bus (23)	PA0309	B13	ic2 (27)
local bus (23)	PA0310	C12	ic2 (32)
local bus (23)	PA0311	D15	ic2 (42)
local bus (23)	PA0312	A13	ic2 (31)
local bus (23)	PA0313	B14	ic2 (41)
local bus (23)	PA0314	C14	ic2 (36)
local bus (23)	PA0315	A14	ic2 (35)
local bus (23)	PA0316	B15	ic2 (46)
local bus (23)	PA0317	C15	ic2 (40)
local bus (23)	PA0318	A15	ic2 (45)
local bus (23)	PA0319	E17	ic2 (39)
local bus (23)	PA0320	E17	ic2 (51)
local bus (23)	PA0321	B16	ic2 (44)
local bus (23)	PA0322	C17	ic2 (50)
local bus (23)	PA0323	E18	ic2 (48)
local bus (23)	PA0324	A16	ic2 (43)
local bus (23)	PA0325	E19	ic2 (56)
local bus (23)	PA0326	D19	ic2 (48)
local bus (23)	PA0327	A17	ic2 (55)
local bus (23)	PA0328	B17	ic2 (47)
local bus (23)	PA0329	C18	ic2 (54)
local bus (23)	PA0330	B18	ic2 (53)
local bus (23)	PA0331	A18	ic2 (50)
local bus (23)	PA0332	C19	ic2 (52)
local bus (23)	PA0333	C19	ic2 (53)
local bus (23)	PA0334	B19	ic2 (58)
local bus (23)	PA0335	A19	ic2 (64)
local bus (23)	PA0336	C20	ic2 (57)
local bus (23)	PA0337	B20	ic2 (68)
local bus (23)	PA0338	F22	ic2 (61)
local bus (23)	PA0339	E22	ic2 (63)
local bus (23)	PA0340	K21	ic2 (82)
local bus (23)	PA0341	C22	ic2 (72)
local bus (23)	PA0342	B21	ic2 (63)
local bus (23)	PA0343	K22	ic2 (73)
local bus (23)	PA0344	K22	ic2 (65)
local bus (23)	PA0345	C23	ic2 (74)
local bus (23)	PA0346	B22	ic2 (66)
local bus (23)	PA0347	K23	ic2 (76)
local bus (23)	PA0348	K23	ic2 (10)
local bus (23)	PA0349	C24	ic2 (77)
local bus (23)	PA0350	B23	ic2 (71)
local bus (23)	PA0351	D24	ic2 (75)
local bus (23)	PA0352	K25	ic2 (78)
local bus (23)	PA0353	C25	ic2 (19)
local bus (23)	PA0354	B25	ic2 (81)
local bus (23)	PA0355	D25	ic2 (80)
local bus (23)	PA0356	K26	ic2 (82)
local bus (23)	PA0357	C26	ic2 (83)
local bus (23)	PA0358	D26	ic2 (85)
local bus (23)	PA0359	C27	ic2 (86)
local bus (23)	PA0360	B27	ic2 (84)
local bus (23)	PA0361	K27	ic2 (83)
local bus (23)	PA0362	D27	ic2 (87)
local bus (23)	PA0363	B27	ic2 (90)
local bus (23)	PA0364	C28	ic2 (88)
local bus (23)	PA0365	K28	ic2 (93)
local bus (23)	PA0366	B28	ic2 (92)
local bus (23)	PA0367	B28	ic2 (91)
local bus (23)	PA0368	C29	ic2 (95)
local bus (23)	PA0369	C29	ic2 (94)
local bus (23)	PA0370	A30	ic2 (96)
local bus (23)	PA0371	D29	ic2 (98)
local bus (23)	PA0372	D29	ic2 (97)
local bus (23)	PA0373	C30	ic2 (99)
local bus (23)	PA0374	B31	ic2 (97)
local bus (23)	PA0375	A31	ic2 (99)
local bus (23)	PA0376	C31	ic2 (103)
local bus (23)	PA0377	B32	ic2 (102)
local bus (23)	PA0378	C31	ic2 (104)
local bus (23)	PA0379	A33	ic2 (110)
local bus (23)	PA0380	C32	ic2 (105)
local bus (23)	PA0381	B33	ic2 (108)
local bus (23)	PA0382	D32	ic2 (111)
local bus (23)	PA0383	D32	ic2 (109)
local bus (23)	PA0384	A34	ic2 (114)
local bus (23)	PA0385	B34	ic2 (112)
local bus (23)	PA0386	D34	ic2 (115)
local bus (23)	PA0387	D33	ic2 (113)
local bus (23)	PA0388	A35	ic2 (118)
local bus (23)	PA0389	C34	ic2 (116)
local bus (23)	PA0390	B35	ic2 (119)
local bus (23)	PA0391	D34	ic2 (117)
local bus (23)	PA0392	A36	ic2 (122)
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local bus (23)	PA0394	B36	ic2 (123)
local bus (23)	PA0395	A36	ic2 (121)

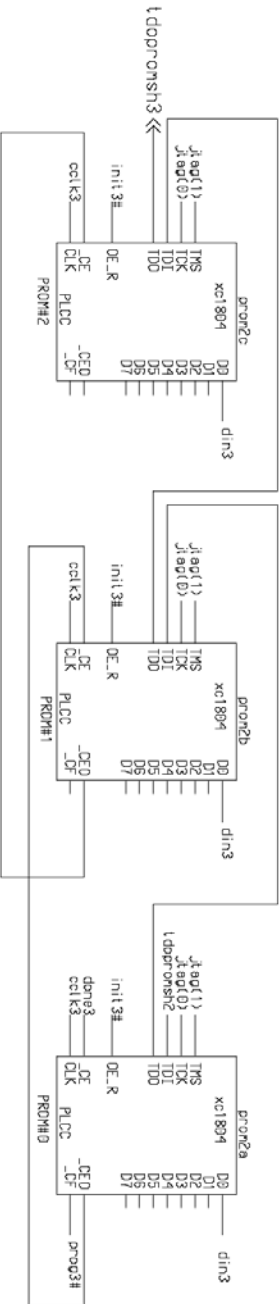
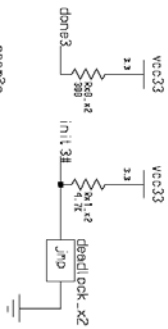
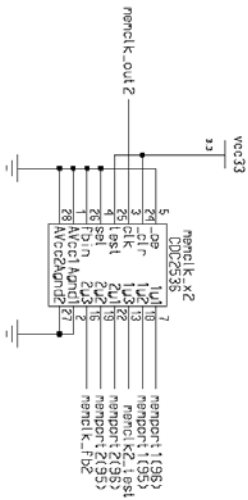
Form  
SRP-5

100-1175

100-1175

100-1175





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clk_bus(15:0)>> clk_bus(15:0)
ldo<1:inx#2>> ldo<1:inx#2>
ldo
memport1(195:0)
memport1(95:0)
memport2(195:0)
memport2(95:0)
out_dut(75:0)
program#

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Jtag(2:0)>> Jtag(2:0)
localbus(81:0)>> localbus(81:0)
ic2(131:0)>> ic2(131:0)

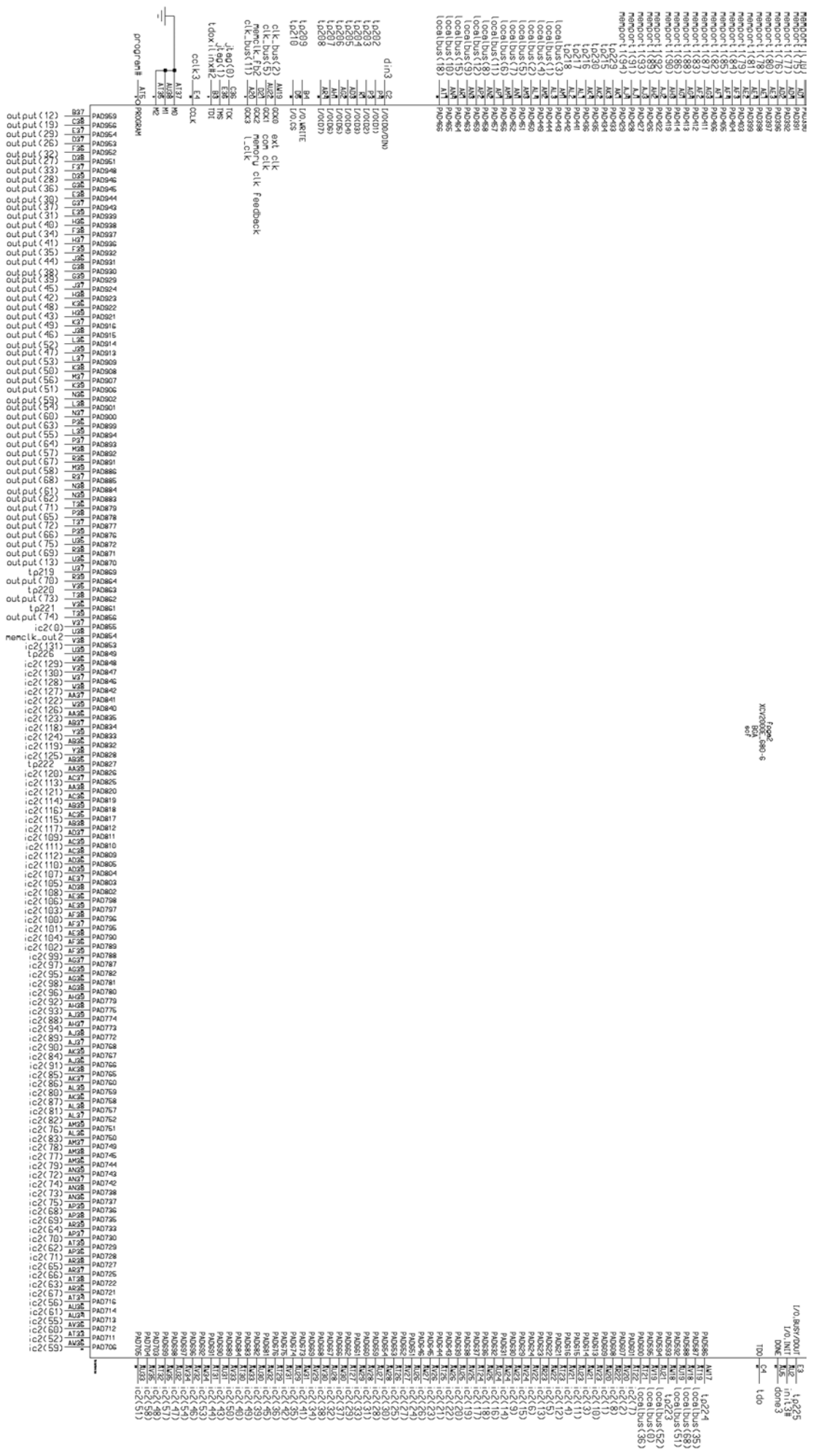
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ldopromsh2>> ldopromsh2

```

10	11	12	13	14	15	16
			Changed by Date DKS Wednesdau, Jul 25, 2001 11:24:19 am		Engineer Drawn by R&D CHK DDC CTRL CHK HW ENDR CHK DA CHK	
			Date Changed Wednesdau, Jul 25, 2001		COMPANY NAME Address City	
			Title fardawid Xilinx		Size Sheet 3 of 3	



Xilinx Zynq-7010

100

MEMPORT (128) F2 MEMPORT (166)  
 MEMPORT (129) F3 MEMPORT (167)  
 MEMPORT (130) F4 MEMPORT (168)  
 MEMPORT (131) F5 MEMPORT (169)  
 MEMPORT (132) F6 MEMPORT (170)  
 MEMPORT (133) F7 MEMPORT (171)  
 MEMPORT (134) F8 MEMPORT (172)  
 MEMPORT (135) F9 MEMPORT (173)  
 MEMPORT (136) FA MEMPORT (174)  
 MEMPORT (137) FB MEMPORT (175)  
 MEMPORT (138) FC MEMPORT (176)  
 MEMPORT (139) FD MEMPORT (177)  
 MEMPORT (140) FE MEMPORT (178)  
 MEMPORT (141) FF MEMPORT (179)  
 MEMPORT (142) F0 MEMPORT (180)  
 MEMPORT (143) F1 MEMPORT (181)  
 MEMPORT (144) F2 MEMPORT (182)  
 MEMPORT (145) F3 MEMPORT (183)  
 MEMPORT (146) F4 MEMPORT (184)

PAD253	F2	MEMPORT (166)
PAD252	F3	MEMPORT (165)
PAD258	F4	MEMPORT (163)
PAD257	F5	MEMPORT (161)
PAD256	F6	MEMPORT (144)
PAD255	F7	MEMPORT (111)
PAD253	F8	MEMPORT (10)
PAD250	F9	MEMPORT (112)
PAD249	FA	MEMPORT (11)
PAD248	FB	MEMPORT (12)
PAD247	FC	MEMPORT (18)
PAD245	FD	MEMPORT (52)
PAD236	FE	MEMPORT (20)
PAD234	FF	MEMPORT (26)
PAD233	F0	MEMPORT (26)
PAD232	F1	MEMPORT (253)
PAD226	F2	MEMPORT (21)
PAD225	F3	MEMPORT (277)
PAD224	F4	MEMPORT (227)
PAD223	F5	MEMPORT (254)
PAD219	F6	MEMPORT (22)
PAD218	F7	MEMPORT (278)
PAD217	F8	MEMPORT (228)
PAD216	F9	MEMPORT (255)
PAD212	FA	MEMPORT (23)
PAD211	FB	MEMPORT (279)
PAD210	FC	MEMPORT (223)
PAD209	FD	MEMPORT (24)
PAD204	FE	MEMPORT (256)
PAD203	FF	MEMPORT (230)
PAD202	F0	MEMPORT (280)
PAD201	F1	MEMPORT (25)
PAD196	F2	MEMPORT (257)
PAD195	F3	MEMPORT (231)
PAD194	F4	MEMPORT (281)
PAD193	F5	MEMPORT (28)
PAD189	F6	MEMPORT (258)
PAD188	F7	MEMPORT (232)
PAD187	F8	MEMPORT (259)
PAD186	F9	MEMPORT (282)
PAD182	FA	MEMPORT (282)
PAD181	FB	MEMPORT (233)
PAD180	FC	MEMPORT (260)
PAD179	FD	MEMPORT (283)
PAD174	FE	MEMPORT (28)
PAD173	FF	MEMPORT (261)
PAD172	F0	MEMPORT (234)
PAD171	F1	MEMPORT (284)
PAD166	F2	MEMPORT (29)
PAD165	F3	MEMPORT (262)
PAD164	F4	MEMPORT (235)
PAD163	F5	MEMPORT (210)
PAD159	F6	MEMPORT (285)
PAD158	F7	MEMPORT (236)
PAD157	F8	MEMPORT (263)
PAD156	F9	MEMPORT (211)
PAD152	FA	lp228
PAD151	FB	MEMPORT (237)
PAD150	FC	MEMPORT (286)
PAD149	FD	MEMPORT (264)
PAD144	FE	MEMPORT (212)
PAD143	FF	lp214
PAD142	F0	MEMPORT (238)
PAD141	F1	MEMPORT (287)
PAD136	F2	MEMPORT (213)
PAD135	F3	MEMPORT (265)
PAD134	F4	MEMPORT (239)
PAD133	F5	MEMPORT (288)
PAD129	F6	MEMPORT (214)
PAD128	F7	MEMPORT (266)
PAD127	F8	MEMPORT (240)
PAD126	F9	MEMPORT (267)
PAD121	FA	MEMPORT (215)
PAD120	FB	MEMPORT (268)
PAD114	FC	MEMPORT (289)
PAD113	FD	MEMPORT (241)
PAD112	FE	lp213
PAD108	FF	MEMPORT (216)
PAD107	F0	MEMPORT (269)
PAD106	F1	MEMPORT (242)
PAD105	F2	MEMPORT (290)
PAD100	F3	MEMPORT (217)
PAD99	F4	lp212
PAD98	F5	MEMPORT (243)
PAD97	F6	MEMPORT (245)
PAD92	F7	MEMPORT (218)
PAD91	F8	MEMPORT (270)
PAD90	F9	MEMPORT (244)
PAD89	FA	MEMPORT (219)
PAD86	FB	MEMPORT (291)
PAD84	FC	MEMPORT (220)
PAD83	FD	MEMPORT (271)
PAD82	FE	MEMPORT (246)
PAD78	FF	MEMPORT (292)
PAD77	F0	MEMPORT (221)
PAD76	F1	MEMPORT (272)
PAD75	F2	MEMPORT (293)
PAD70	F3	MEMPORT (247)
PAD69	F4	MEMPORT (273)
PAD68	F5	MEMPORT (222)
PAD67	F6	MEMPORT (294)
PAD62	F7	MEMPORT (248)
PAD61	F8	MEMPORT (274)
PAD60	F9	MEMPORT (223)
PAD59	FA	MEMPORT (249)
PAD55	FB	MEMPORT (250)
PAD54	FC	MEMPORT (224)
PAD53	FD	MEMPORT (275)
PAD52	FE	MEMPORT (225)
PAD48	FF	lp227
PAD47	F0	MEMPORT (251)
PAD46	F1	lp211
PAD45	F2	out.put (0)
PAD40	F3	out.put (20)
PAD39	F4	out.put (1)
PAD38	F5	out.put (6)
PAD37	F6	out.put (7)
PAD32	F7	out.put (14)
PAD31	F8	out.put (2)
PAD30	F9	out.put (21)
PAD29	FA	out.put (15)
PAD25	FB	out.put (8)
PAD24	FC	out.put (22)
PAD23	FD	out.put (3)
PAD22	FE	out.put (16)
PAD18	FF	out.put (9)
PAD17	F0	out.put (23)
PAD16	F1	out.put (4)
PAD15	F2	out.put (17)
PAD10	F3	out.put (10)
PAD9	F4	out.put (24)
PAD8	F5	out.put (5)
PAD7	F6	out.put (18)
PAD5	F7	out.put (11)
PAD2	F8	out.put (25)

MEMPORT (128)  
 MEMPORT (129)  
 MEMPORT (130)

MEMPORT (128)  
 MEMPORT (129)  
 MEMPORT (130)

MEMPORT (128)  
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MEMPORT (128)  
 MEMPORT (129)  
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MEMPORT (128)  
 MEMPORT (129)  
 MEMPORT (130)

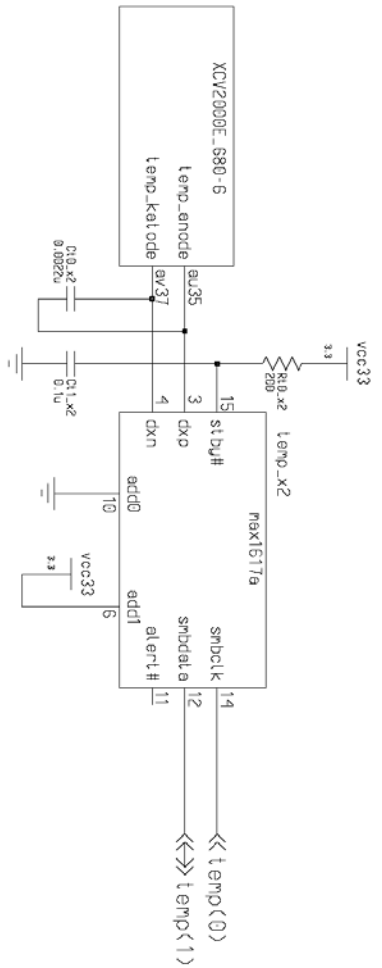
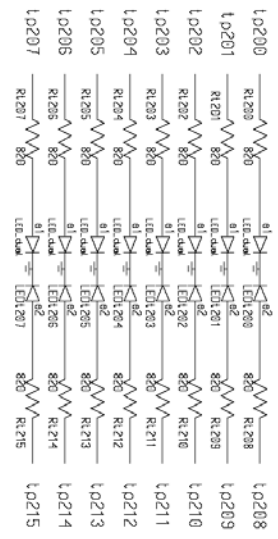
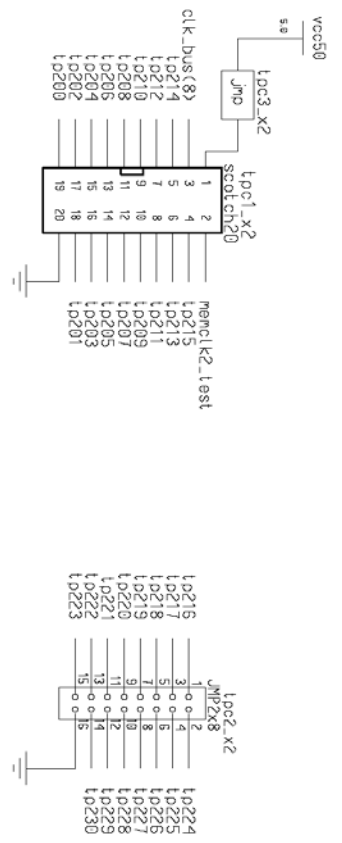
MEMPORT (128)  
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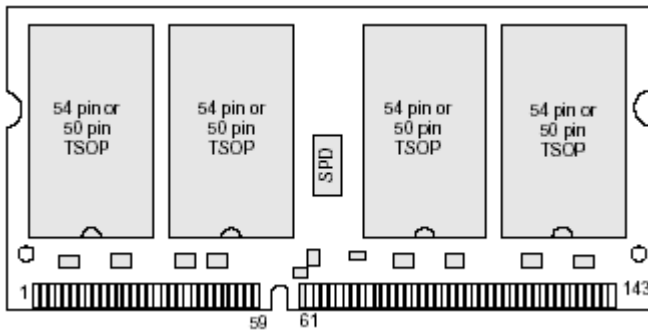
MEMPORT (128)  
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MEMPORT (128)  
 MEMPORT (129)  
 MEMPORT (130)





## E.6 Memory kontakt



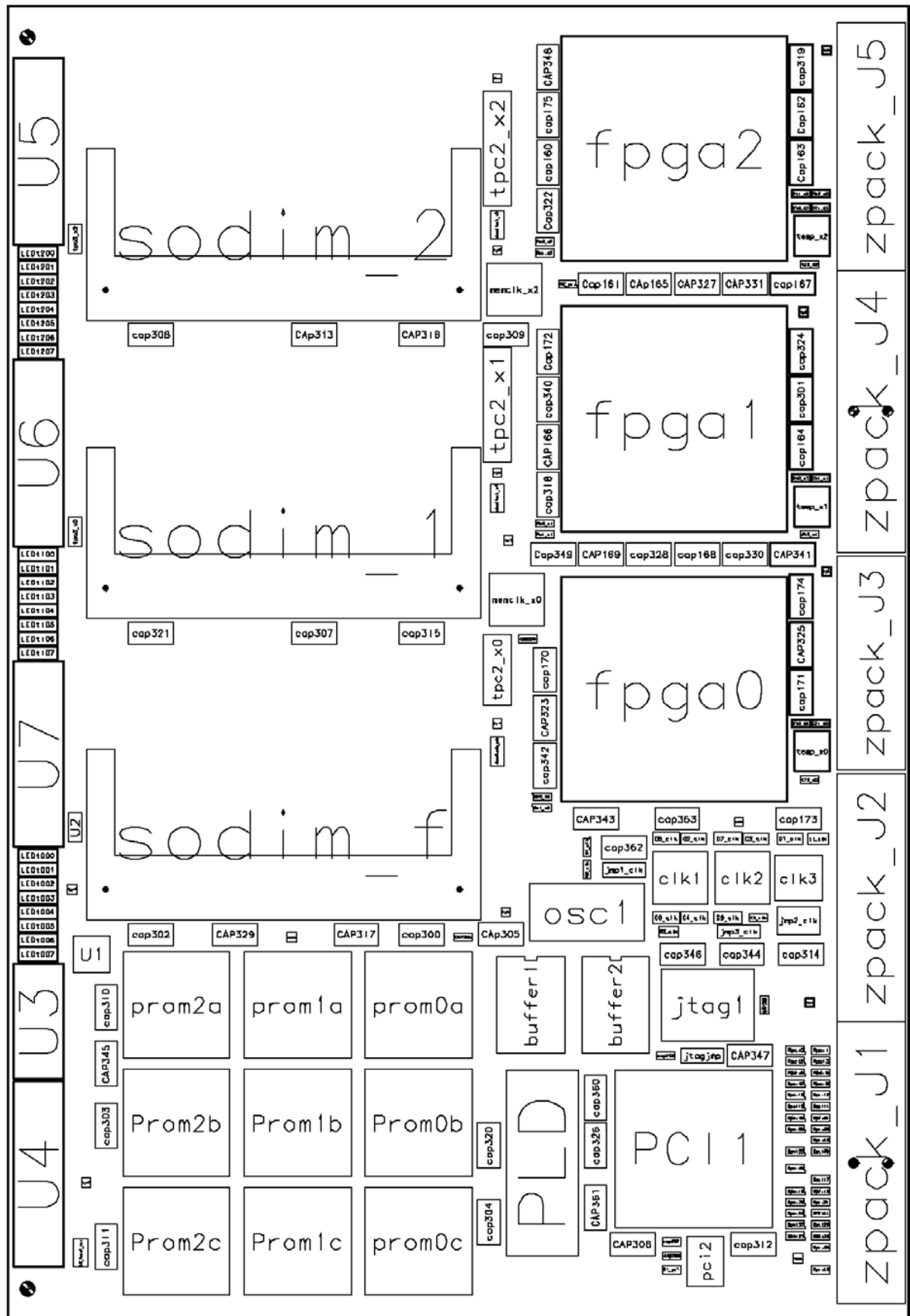
Signal Name	Pin	Pin	Signal Name
Vss	1	2	Vss
DQ0	3	4	DQ32
DQ1	5	6	DQ33
DQ2	7	8	DQ34
DQ3	9	10	DQ35
Vdd	11	12	Vdd
DQ4	13	14	DQ36
DQ5	15	16	DQ37
DQ6	17	18	DQ38
DQ7	19	20	DQ39
Vss	21	22	Vss
DQMB0	23	24	DQMB4
DQMB1	25	26	DQMB5
Vdd	27	28	Vdd
A0	29	30	A3
A1	31	32	A4
A2	33	34	A5
Vss	35	36	Vss
DQ8	37	38	DQ40
DQ9	39	40	DQ41
DQ10	41	42	DQ42
DQ11	43	44	DQ43
Vdd	45	46	Vdd
DQ12	47	48	DQ44
DQ13	49	50	DQ45
DQ14	51	52	DQ46
DQ15	53	54	DQ47
Vss	55	56	Vss
Reserved	57	58	Reserved
Reserved	59	60	Reserved
CLK0	61	62	CKE0
Vdd	63	64	Vdd
RAS#	65	66	CAS#
WE#	67	68	CKE1
S0#	69	70	A12

Signal Name	Pin	Pin	Signal Name
S1#	71	72	A13
Reserved	73	74	CLK1
Vss	75	76	Vss
Reserved	77	78	Reserved
Reserved	79	80	Reserved
Vdd	81	82	Vdd
DQ16	83	84	DQ48
DQ17	85	86	DQ49
DQ18	87	88	DQ50
DQ19	89	90	DQ51
Vss	91	92	Vss
DQ20	93	94	DQ52
DQ21	95	96	DQ53
DQ22	97	98	DQ54
DQ23	99	100	DQ55
Vdd	101	102	Vdd
A6	103	104	A7
A8	105	106	BA0
Vss	107	108	Vss
A9	109	110	BA1
A10	111	112	A11
Vdd	113	114	Vdd
DQMB2	115	116	DQMB6
DQMB3	117	118	DQMB7
Vss	119	120	Vss
DQ24	121	122	DQ56
DQ25	123	124	DQ57
DQ26	125	126	DQ58
DQ27	127	128	DQ59
Vdd	129	130	Vdd
DQ28	131	132	DQ60
DQ29	133	134	DQ61
DQ30	135	136	DQ62
DQ31	137	138	DQ63
Vss	139	140	Vss
SDA	141	142	SCL
Vdd	143	144	Vdd

Note: Reserved = Do not connect

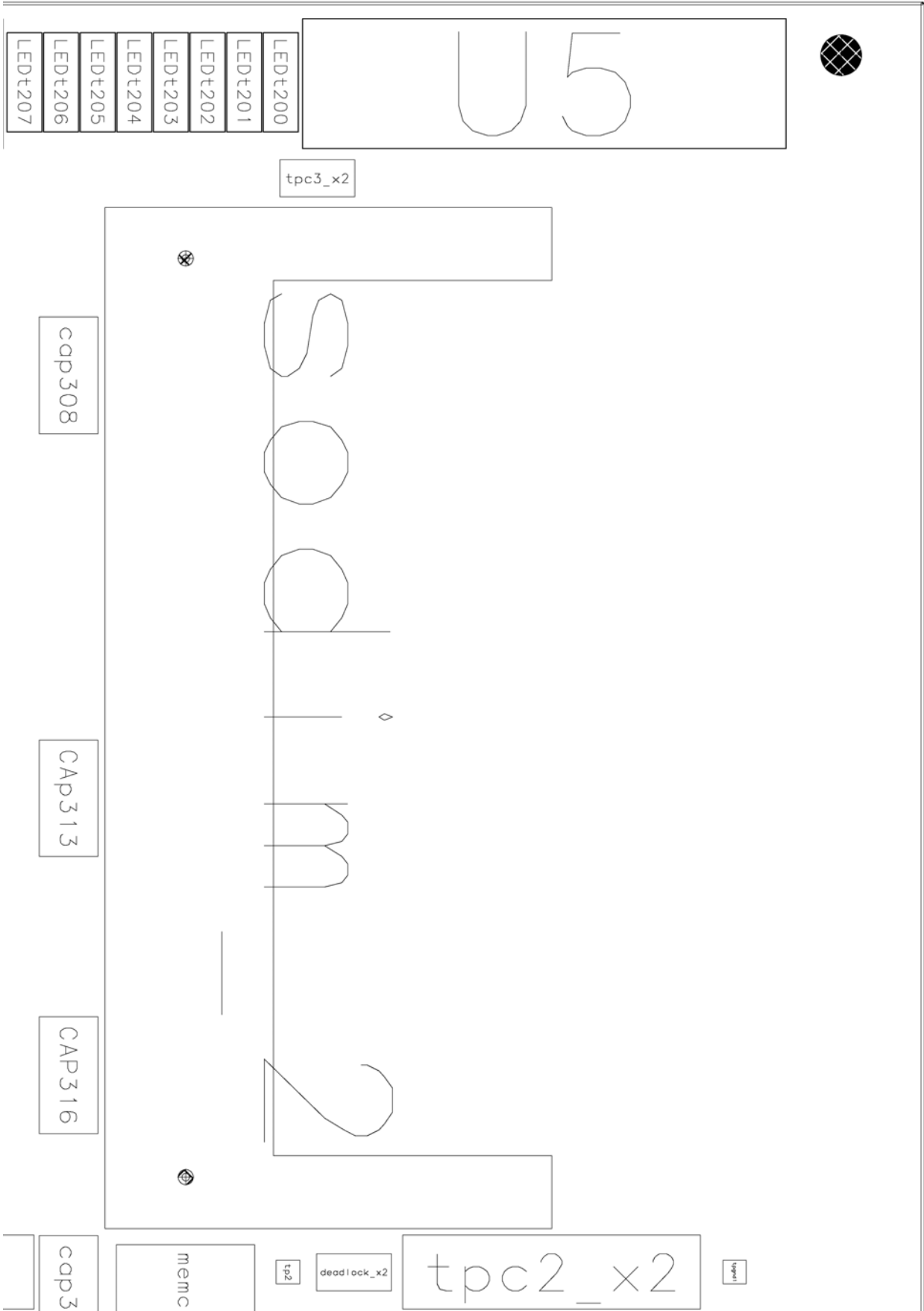
F FYSISK UTLEGG

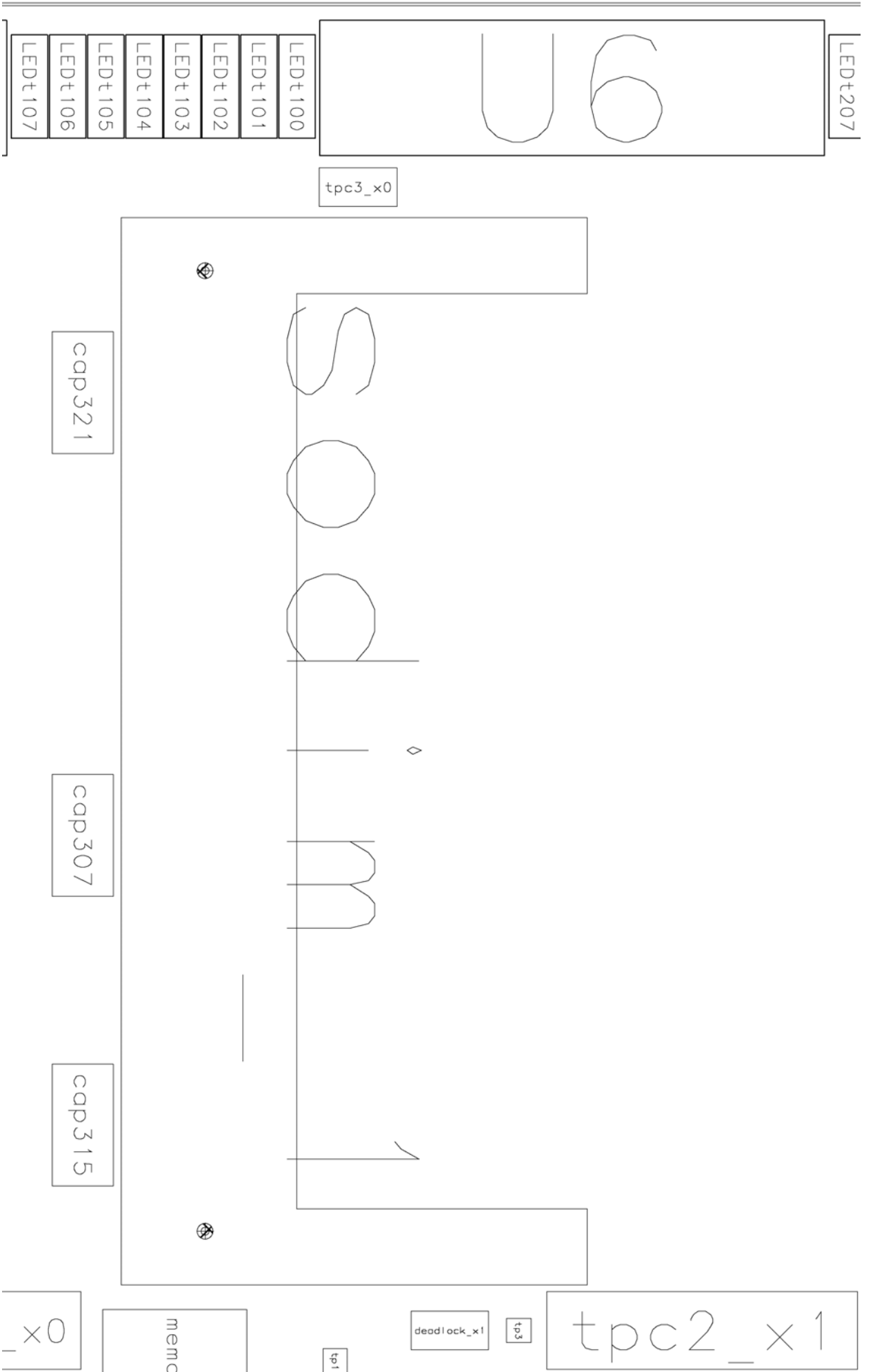
F.1 Printkort oversikt

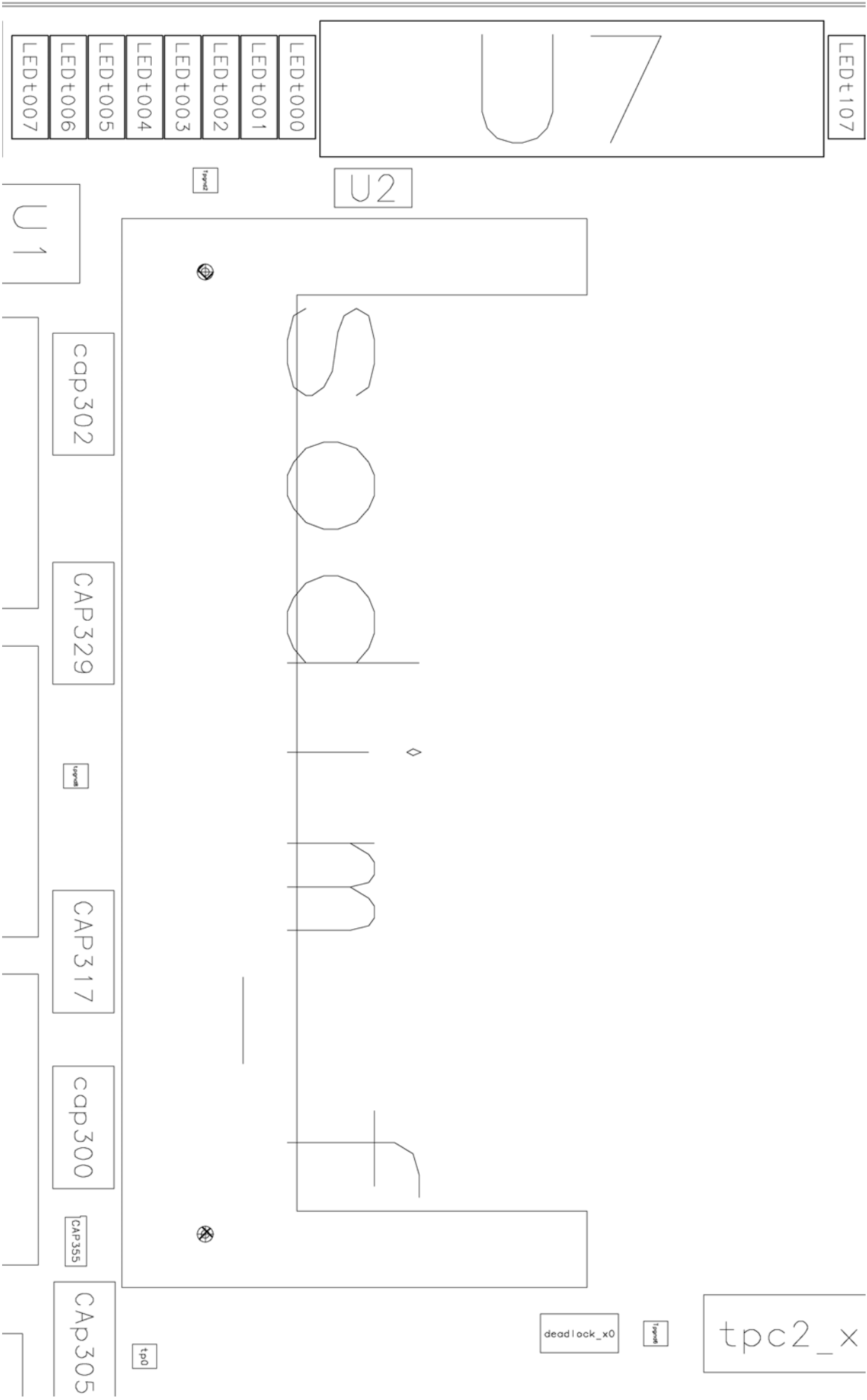


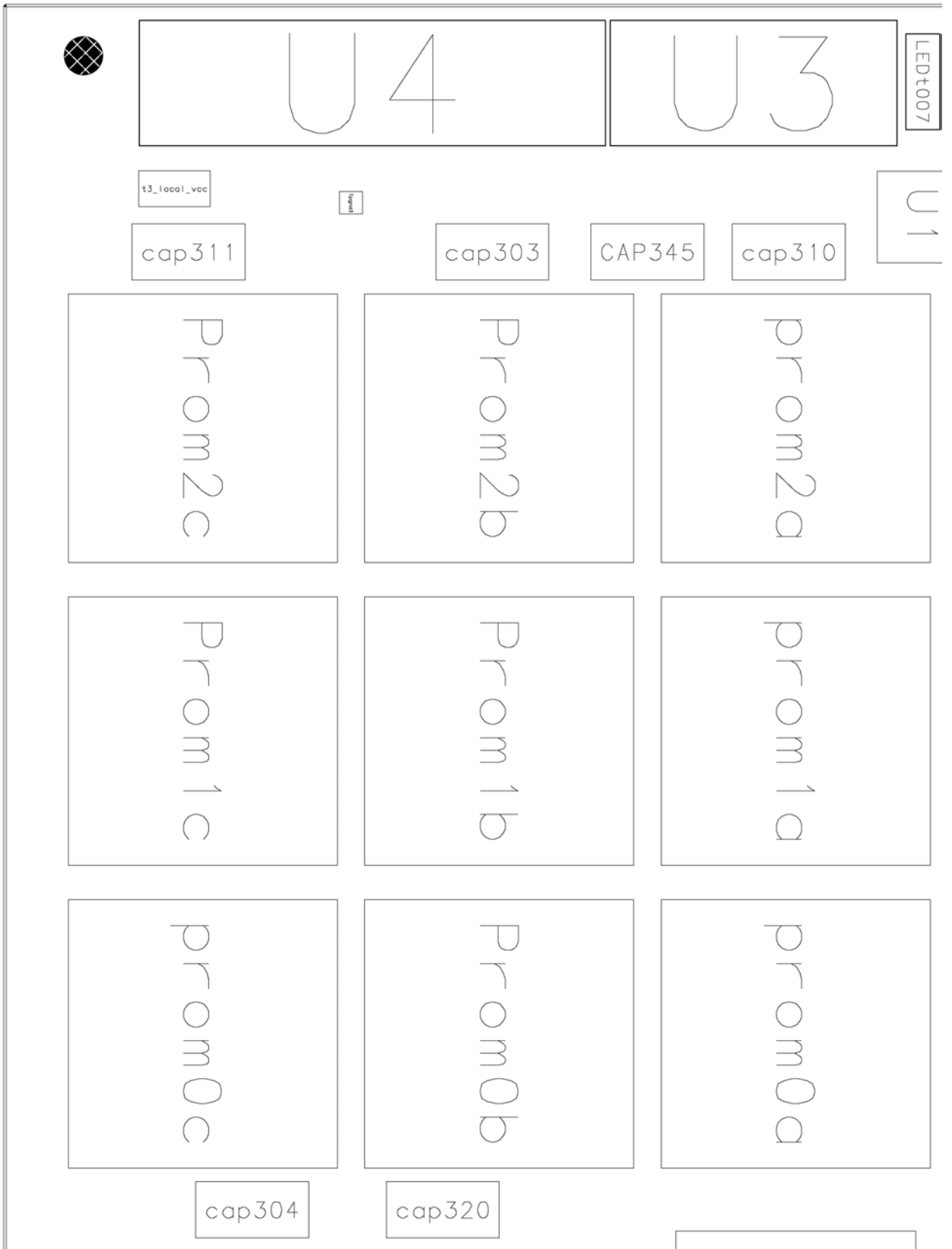
dob\_europa\_PC1

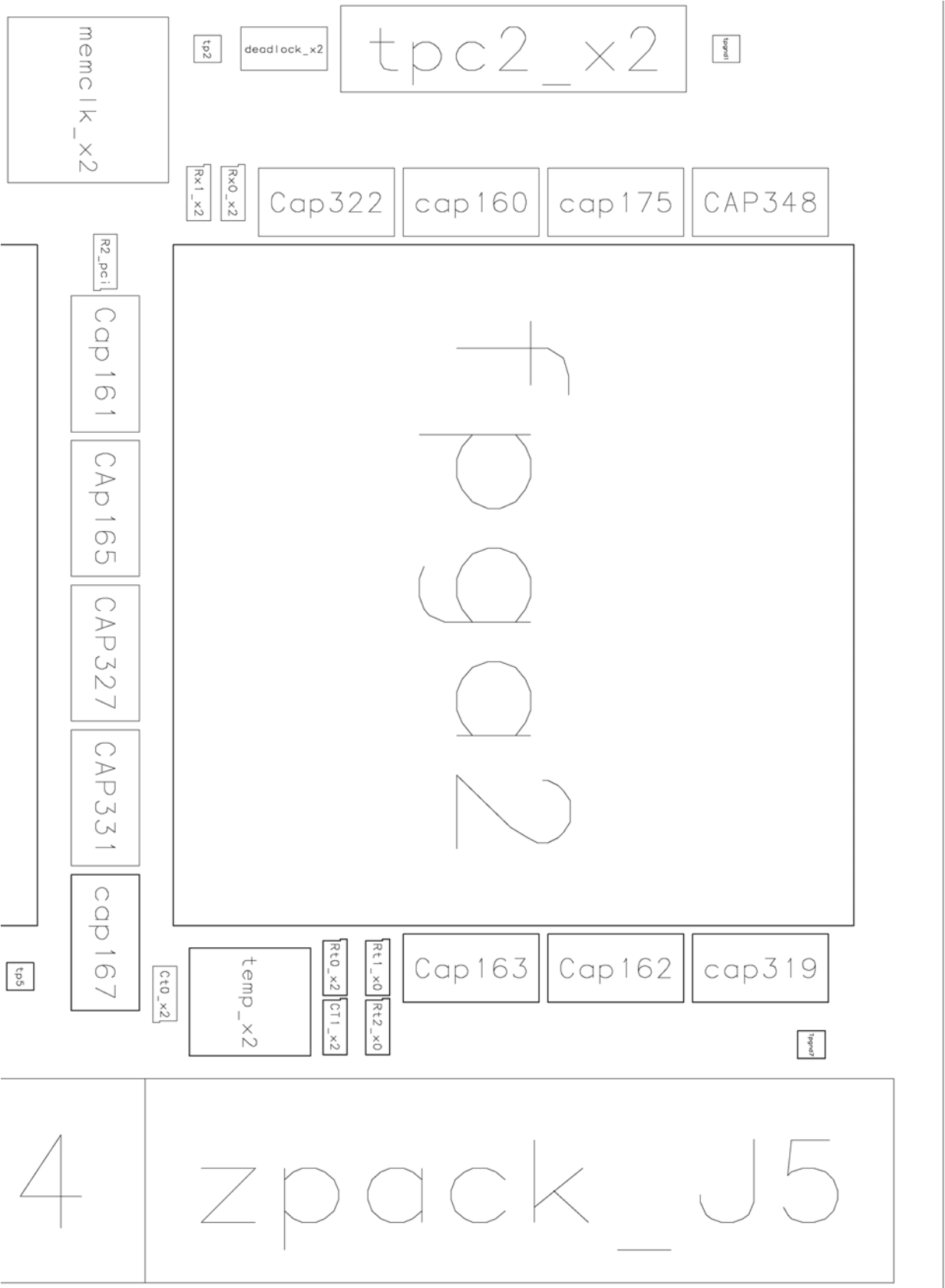
F.1.1 Detaljbilder forside



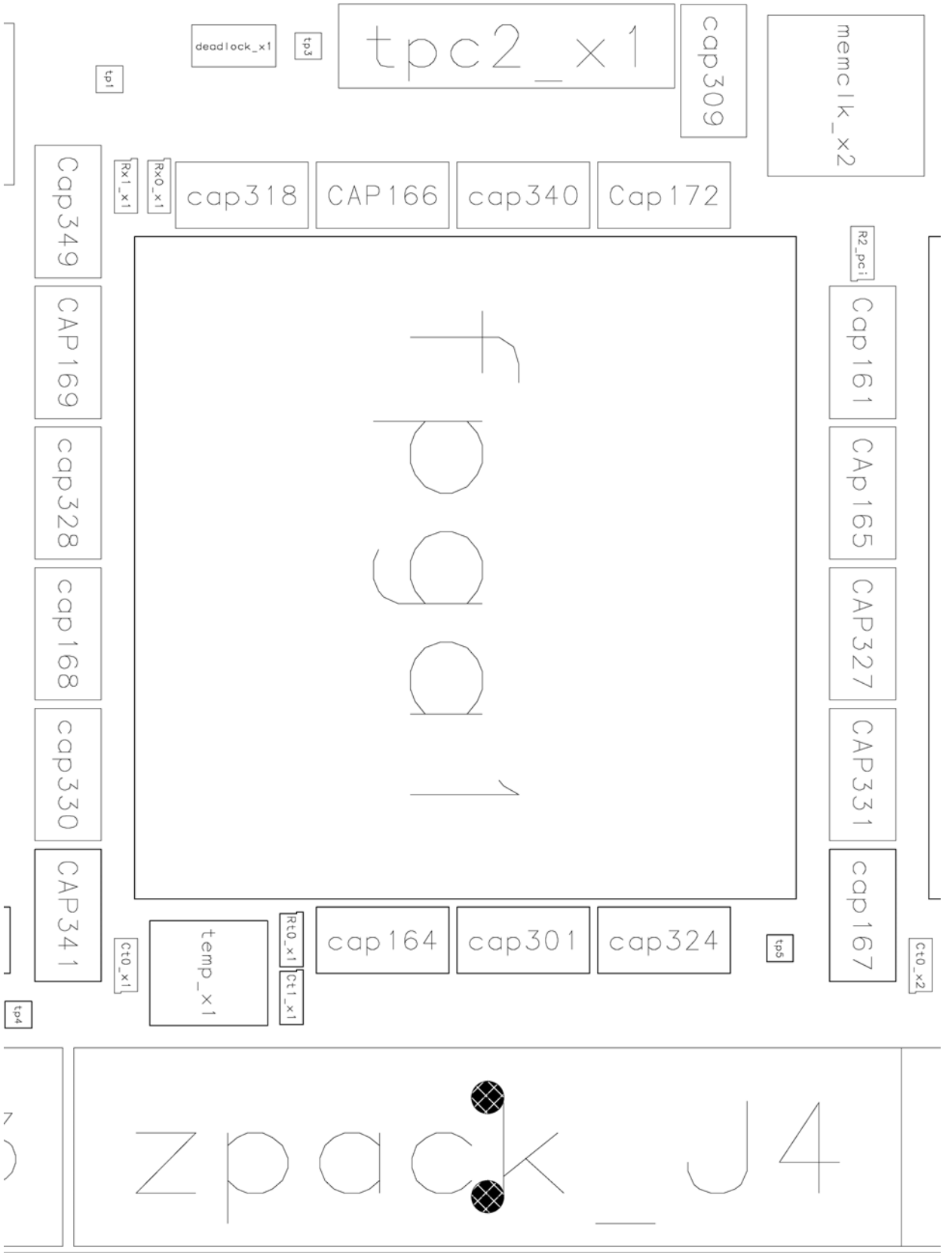


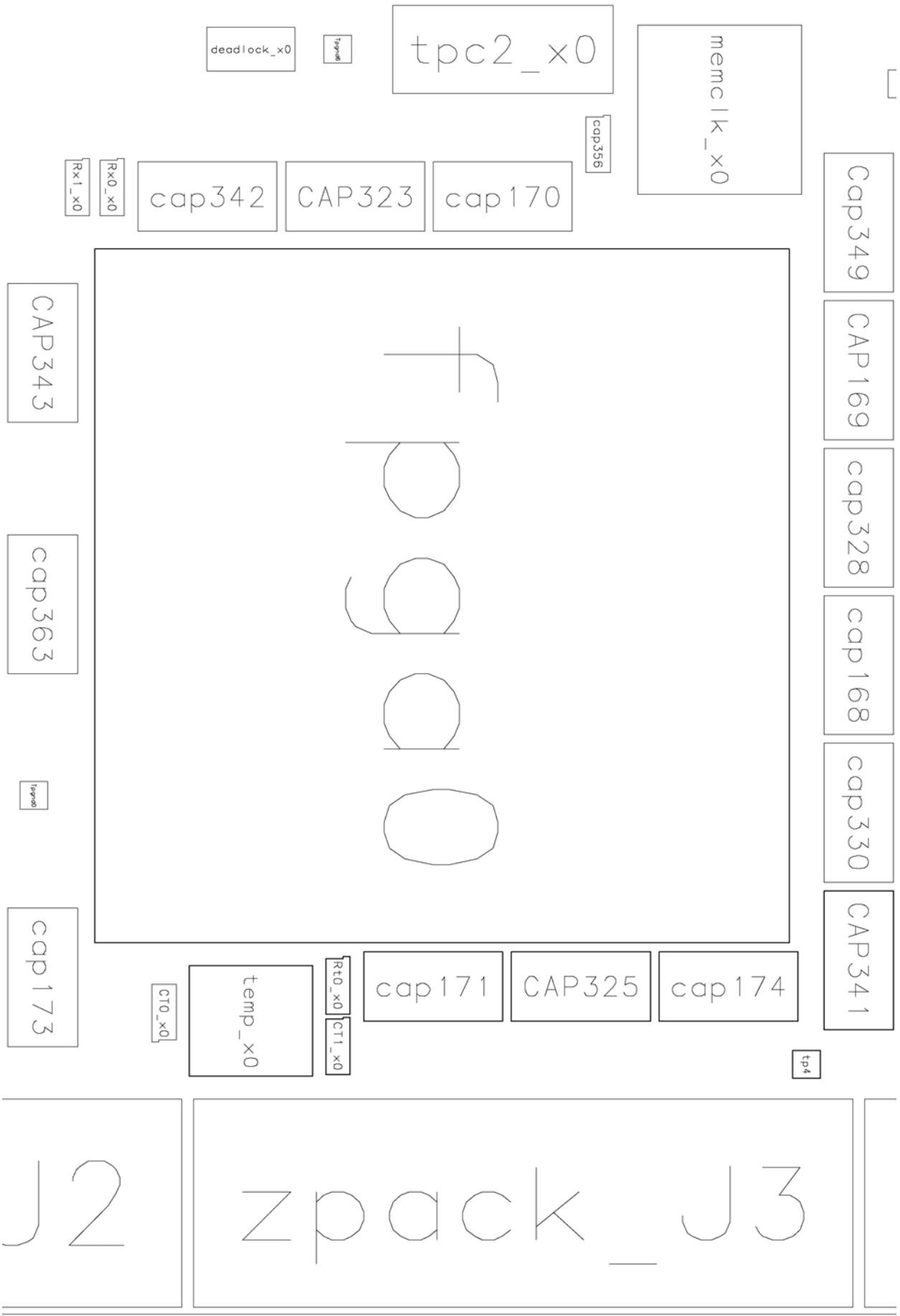


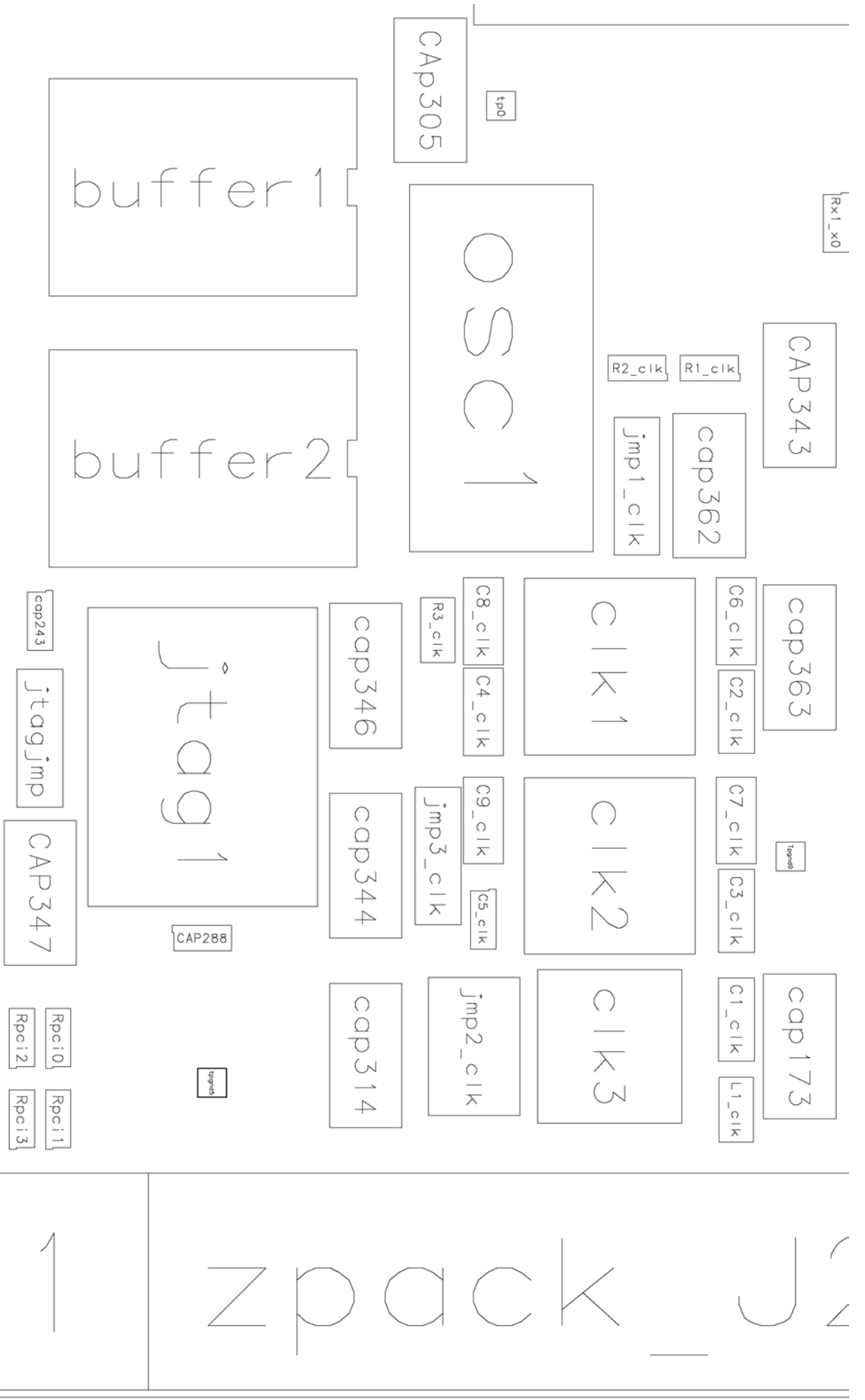












Zpack\_1

1

bu

bu

cap304

cap320

PLD

CAP361

cap326

cap360

CAP306

PC11

cap243

jtaqjmp

CAP347

cap237

cap299

R1\_pci

pci2

cap312

Rpci10

Rpci12

Rpci15

Rpci47

Rpci10

Rpci13

Rpci46

Rpci36

Rpci32

Rpci45

Rpci19

Rpci23

Rpci24

Rpci27

Rpci31

Rpci

Rpci1

Rpci3

Rpci6

Rpci8

Rpci12

Rpci14

Rpci34

Rpci33

Rpci43

Rpci39

Rpci17

Rpci18

Rpci21

Rpci44

Rpci26

Rpci30

Rpci35

Rpci40

YKPCPN

F.1.2 Detaljbilder bakside



Rt200  
Rt201 Rt202  
Rt204 Rt203  
Rt205 Rt206  
Rt208 Rt207  
Rt209 Rt210  
Rt211 Rt212  
Rt213 Rt214  
Rt215



cap294

Cap241

cap293

Cap240



Rt100 Rt102  
Rt101 Rt103  
Rt103 Rt104  
Rt105 Rt106  
Rt108 Rt107  
Rt109 Rt110  
Rt111 Rt112  
Rt113 Rt114  
Rt115



cap296

CAP242

cap295

CAP244



Rt000  
Rt001  
Rt002  
Rt003  
Rt004  
Rt005  
Rt006  
Rt007  
Rt008  
Rt009  
Rt010  
Rt011  
Rt012  
Rt013  
Rt014  
Rt015



cap298

cap246

cap297

cap247





cap268

cap259

cap258

cap218

cap209

cap208

cap269

cap278

cap279

cap219

cap228

cap229

cap280

cap281

cap282

cap230

cap231

cap232



cap 130	CAP250	CAP131	cap 132	cap251	CAP133
cap 100	cap200	cap 101	cap 102	cap201	cap 103
cap255					CAP256
cap205					cap206
cap 136					CAP108
cap 109					cap 135
CAP204					CAP207
CAP254					cap257
cap 107	cap203	cap 106	cap 105	cap202	cap 104
CAP137	cap253	cap 138	CAP139	CAP252	cap 134

cap292  
CAP248

cap140	cap260	CAP141	cap142	cap261	CAP143
CAP110	cap210	CAP111	CAP112	CAP211	CAP113
CAP265					cap266
cap215					CAP216

CAP148	cap118				CAP119	CAP149
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CAP214	cap214				cap217
cap264					cap267
CAP117	cap213	cap116	CAP115	CAP212	cap114
cap147	cap263	cap146	CAP145	cap262	cap144



cqp289  
cqp239

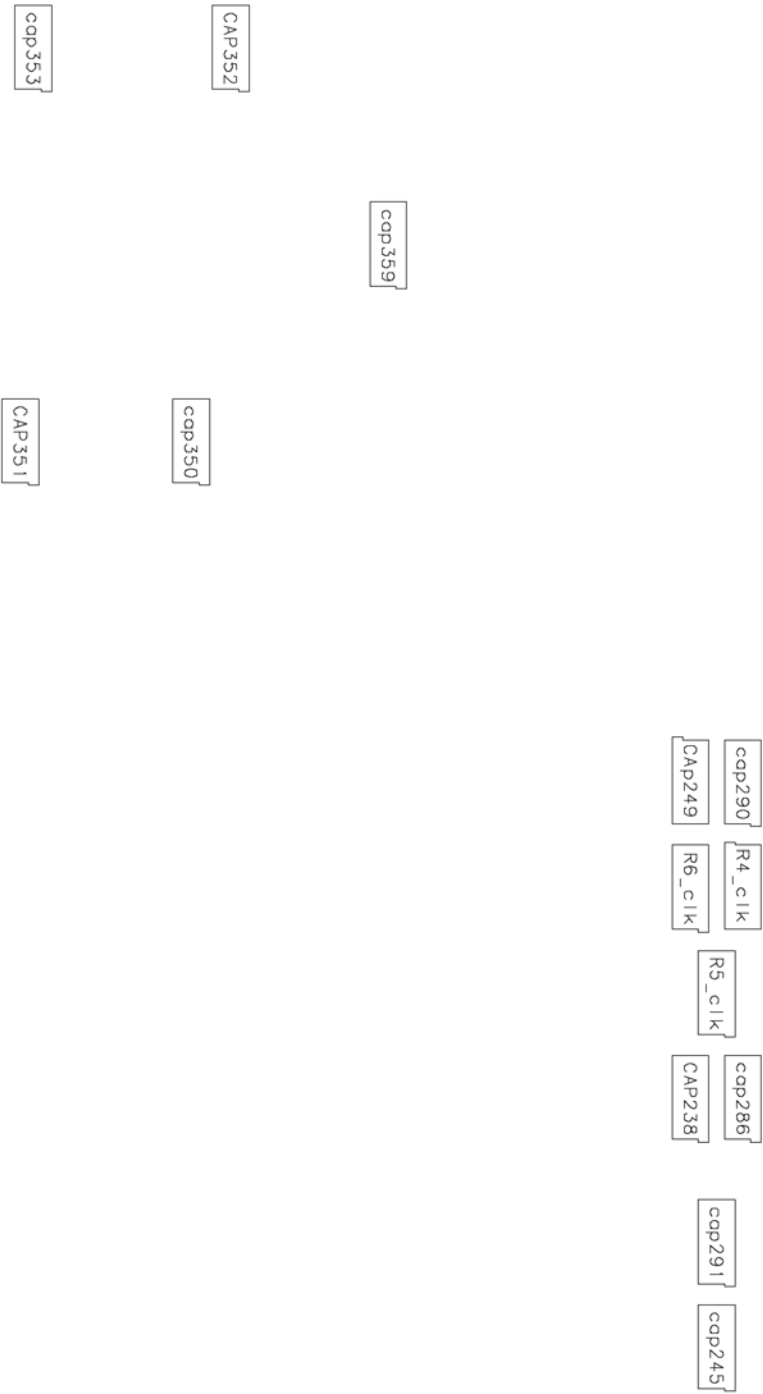
cqp 150	cqp270	CAP 151	cqp 152	Cqp271	CAP 153
cqp 120	CAP220	CAP 121	cqp 122	cqp221	cqp 123
cqp275					cqp276
cqp225					CAP226

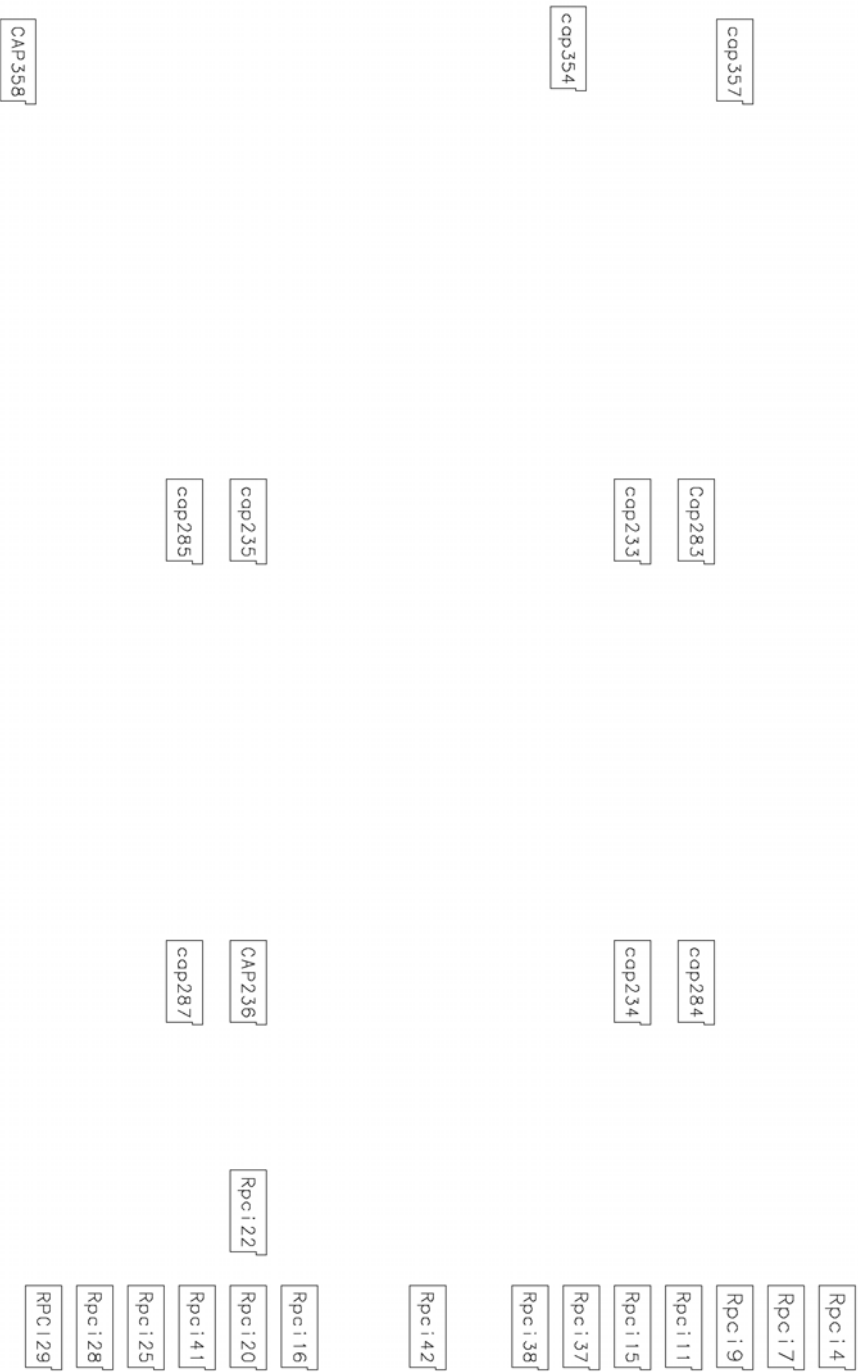
cqp 158  
cqp 128

CAP 129  
Cqp 159

CAP224					cqp227
cqp274					cqp277
CAP 127	cqp223	cqp 126	CAP 125	cqp222	cqp 124
CAP 157	cqp273	cqp 156	CAP 155	cqp272	cqp 154







**Litteratur**

- (1) Johnsrud S, Tansem I (2002): Digital multistatisk radar, sender og mottaker, FFI/RAPPORT-2002/01931, Forsvarets forskningsinstitutt
- (2) Johnsen T, Olsen K E, Johnsrud S, Gundersen R, Bjordal H, Tansem I, Sørnes P (2002): Multistatisk CW radar - Konsept, FFI/RAPPORT-2002/01767, Forsvarets forskningsinstitutt
- (3) Tansem I, Gundersen R, Bjordal H, Johnsen T, Johnsrud S, Olsen K E, Sørnes P (2002): Digital multistatisk radar, overordnet maskinvarebeskrivelse, FFI/RAPPORT-2002/02453, Forsvarets forskningsinstitutt

## FORDELINGSLISTE

**FFIE**
**Dato: 25 juli 2002**

RAPPORTTYPE (KRYSS AV) <input checked="" type="checkbox"/> RAPP <input type="checkbox"/> NOTAT <input type="checkbox"/> RR	RAPPORT NR. 2002/02364	REFERANSE FFIE/726/170	RAPPORTENS DATO 25 juli 2002
RAPPORTENS BESKYTTELSESGRAD  UGRADERT		ANTALL EKS UTSTEDT  26	ANTALL SIDER  69
RAPPORTENS TITTEL REKONFIGURERBAR PROSESSERINGSMODUL - FPGAkort versjon2		FORFATTER(E) SØRNES Per K	
FORDELING GODKJENT AV FORSKNINGSSJEF  John-Mikal Størdal		FORDELING GODKJENT AV AVDELINGSSJEF:  Johnny Bardal	

**EKSTERN FORDELING**
**INTERN FORDELING**

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1		Major Sverre Vestad, LVI	14		FFI-Bibl
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1		FO/SST	1		FFIE
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			1		FFIBM
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